Project Manual

Church Building Renovation & Addition

Trinity United Methodist Church

4400 W. 19th Street, Panama City, Florida

Architect's Project #: 24002

ISSUED FOR BIDS

03/02/2026

Jennifer P. Jones, Architect, LLC
7901 4th Street N, Ste 300
St. Petersburg, FL 33702
251-210-2362
Jennifer P. Jones, Registered Architect
Florida License No: RA103362

Copyright © 2026 Jennifer P. Jones, Architect, LLC. All rights reserved.

Project Manual

Project: Church Building Renovation & Addition
Owner: Trinity United Methodist Church
Address: 4400 W. 19th Street, Panama City, FL 32405
Architect's Project #: 24002
Date: 03/02/2026

Table of Contents

Division 00 – Procurement and Contracting Requirements

Bidding Requirements

- Advertisement for Bids, Pre-Bid Meeting, and Pre-Qualification of Bidders
- Application for Pre-Qualification
- 002113 Instructions for Pre-Qualification
- Instructions to Bidders (AIA A701-2018)
- 002513 Prebid Meeting
- 002600 Procurement Substitution Procedures
- 003119 Existing Condition Information
- 003132 Geotechnical Data
    - Copy of Geotechnical Engineering Report dated 10/01/2024
- 004113 Bid Form – Stipulated Sum (Single-Prime Contract)
- 004393 Proposed Schedule of Values Form
- 004393 Bid Submittal Checklist

Contracting Requirements

- 006000 Project Forms
- Standard Form of Agreement between Owner and Contractor (AIA A101-2017)
- Exhibit A: Insurance and Bonds (AIA A101-2017)
- General Conditions of the Contract for Construction (AIA A201-2017)
- 007300 Supplementary Conditions
- 007400 Special Conditions
    - Appendix A: Certification Regarding Lobbying
    - Appendix B: Certification Regarding Debarment and Suspension

Division 01 – General Requirements

011000 Summary
012100 Allowances
012300 Alternates
012500 Substitution Procedures
012600 Contract Modification Procedures
012900 Payment Procedures
013100 Project Management and Coordination
013200 Construction Progress Documentation
013300 Submittal Procedures
013516 Alteration Project Procedures
014000 Quality Requirements
014100 Structural Tests and Special Inspections*
014200 References
014339 Mockups
015000 Temporary Facilities and Controls
016000 Product Requirements
017300 Execution
017700 Closeout Procedures
017823 Operation and Maintenance Data
017839 Project Record Documents
017900 Demonstration and Training

Division 02 – Existing Conditions

024119 Selective Demolition

Division 03 – Concrete

033000 Cast-in-Place Concrete*
035416 Hydraulic Cement Underlayment

Division 04 – Masonry

042000 Unit Masonry

Division 05 – Metals

055213 Pipe and Tube Railings

Division 06 – Wood, Plastics, and Composites

061000 Rough Carpentry*
061600 Sheathing
061753 Shop-Fabricated Wood Trusses*

Division 07 – Thermal and Moisture Protection

072100	Thermal Insulation
072119	Foamed-In-Place Insulation
072726	Fluid-Applied Membrane Air Barriers
073113	Asphalt Shingles
074616	Aluminum Siding
077100	Roof Specialties
079200	Joint Sealants

Division 08 – Openings

081113	Hollow Metal Doors and Frames
081433	Stile and Rail Wood Doors
081433.13	Wood Terrace Doors
083313	Coiling Counter Doors
085423	Fiberglass Windows
087111	Door Hardware (to be provided by Addendum)

Division 09 – Finishes

092900	Gypsum Board
093013	Ceramic Tiling
096519	Resilient Tile Flooring
099113	Exterior Painting
099123	Interior Painting
099300	Staining and Transparent Finishing

Division 10 – Specialties

011423.16	Room-Identification Panel Signage
102800	Toilet, Bath, and Laundry Accessories
104413	Fire Protection Cabinets
104416	Fire Extinguishers

Division 11 – Equipment

113013	Residential Appliances

Division 12 – Furnishings

123530	Residential Casework
123623.13	Plastic-Laminate-Clad Countertops
123640	Stone Countertops
123661	Stimulated Stone Countertops

Division 31 – Earthwork
313116 Termite Control

Division 15 – Mechanical

Division 16 – Electrical

See Table of Contents for Divisions 15 and 16 are listed at the beginning of those sections.

Note: This Table of Contents is for convenience only. Its accuracy and completeness is not guaranteed, and it is not to be considered as part of the Specifications. In case of discrepancy between the Table of Contents and the Specifications, the Specifications shall govern.

* Specification Sections marked with an asterisk were specified by the Structural Engineer.

Advertisement for Bids, Pre-Bid Meeting, and Pre-qualification of Bidders

Project:
Church Building Renovation & Addition
Owner:
Trinity United Methodist Church, Panama City, FL
Architect's Project Number: 24002

Sealed bids for the renovation and construction of the above-referenced project will be received by Trinity United Methodist Church on **Tuesday, March 24, 2026 at 2:00 pm CT**, in the Conference Room of Trinity United Methodist Church (4400 W. 19th Street, Panama City, FL 32405), at which time and place they will be publicly opened and read. Only contractors who have been pre-qualified and have a representative present at a mandatory Pre-Bid and Site Walkthrough Meeting scheduled for **Tuesday, March 10, 2026 at 10:00 am CT** at the location indicated above will be eligible to bid. Small businesses, minority businesses, women's business enterprises, veteran-owned businesses, and labor surplus area firms are encouraged to participate.

Only general contractors who have completed the pre-qualification process and are certified as qualified will be eligible to bid. Qualification and approval criteria may be obtained from the Architect upon written request. The Pre-qualification process is intended to identify responsible and competent general contractors relative to the requirements of the project. Completed applications for Prequalification must be received by the Architect by **Tuesday, February 24, 2026 at 3:00 pm CT**. No further requests will be considered after this date and time. The Owner reserves the right to waive technical errors in pre-qualification applications or abandon the pre-qualification process in whole or in part should the interests of the Owner appear to be promoted thereby.

The project consists of the renovation of a +/- 3,858 SF area of an existing building and the construction of a +/- 3,201 SF addition on Trinity United Methodist Church's campus at 4400 W. 19th Street, Panama City, FL 32405. The addition will be a single-story, slab-on-grade and CMU structure with brick veneer, wood roof trusses, asphalt shingle roofing, and associated electrical, mechanical, plumbing, and fire alarm systems. Exterior improvements include a stormwater pond, drives, parking, sidewalks, ramps, fencing, irrigation, and landscaping. The estimated cost of construction is approximately $2,000,000. This project is funded by a Public Assistance Grant from the Federal Emergency Management Agency (FEMA Project No. 80448). As such, the applicable

Federal procurement requirements of 2 CFR Part 200:318 through 200:326 shall apply to the submittal, opening, and award of bids.

A Bid Bond payable to Trinity United Methodist Church in an amount not less than five percent (5%) of the total bid amount must accompany the Bid. Performance and Payment Bonds and Evidence of Insurance as required in the Bid Documents will be required at the signing of the Contract. Bids must be submitted on the Bid Form furnished in the Project Manual. General Contractors shall display their current license number on the outside of the sealed envelope in which the Bid is delivered. The Owner reserves the right to reject any or all bids and to waive technical errors if, in the Owner's judgement, the best interest of the Owner will thereby be promoted.

Interested General Contractors should request a Pre-Qualification application from Ms. Jennifer Jones at jennifer@jpjarchitect.com or 251-210-2362.

Pre-qualified General Contractors (prime bidders only) may obtain digital copies of the Contract Documents by contacting Ms. Jennifer Jones at jennifer@jpjarchitect.com or 251-210-2362.

Architect: Jennifer P. Jones, Architect, LLC

Application for Pre-Qualification

Project: **Church Building Renovation & Addition, Panama City, FL**
Architect's Project #: **24002**
Owner: **Trinity United Methodist Church, Panama City, FL**
Application Deadline: **3:00pm Central Time on Tuesday, February 24, 2026**

Submit electronically to Architect via email at jennifer@jpjarchitect.com

The project is funded by a Public Assistance Grant from the Federal Emergency Management Agency (FEMA Project No. 80448). As such, any contract must be awarded only to a responsible contractor that possesses the ability to perform successfully under the terms and conditions of the proposed contract. The Owner must consider contractor integrity, public policy compliance, proper classification of employees, past performance record, and financial and technical resources.

Thus, the purpose of the Prequalification Procedure described in this Document is to provide Owner with a mechanism to evaluate and determine whether Prospective Bidders are qualified to participate in the construction of the Project. Evaluation will be limited to that office of the Prospective Bidder that is proposed to perform the Work. The information received from Contractors will be kept strictly confidential.

To be considered for Prequalification, Prospective Bidders must submit the following by the deadline stated above:

1. Contractor's Qualification Statement
   Submit the following information to document your company's organization, financial standing, classification, and approach to quality control:
   a. AIA Document A305-2020 "Contractor's Qualification Statement"
      i. Shall be fully executed and indicate Contractor's financial capacity.
      ii. Note requirement to attach a financial statement.
      iii. Indicate current classification and bid limit as issued by the Construction Industry Licensing Board (CILB) operated by the Florida Department of Business and Professional Regulation (DBPR)
2. Business Philosophy, Claims, and Litigation
   Prospective Bidders must demonstrate to the Owner a history of cooperation and good will toward past Owners, Architects, and Subcontractors in the completion of past projects.
   a. The application must include a list of all current and pending litigations against an Owner, Architect, or Subcontractor. Include cases wherein the litigation or arbitration of claims exceeded $25,000.
3. Subcontractors list
   a. Submit a list of major Subcontractors with whom you have worked on similar projects and may consider for this project

4. Bonding Capacity

   Provide written statements from the Surety company documenting the following:

   a. The Contractor can provide a bond equal to 100% of the project cost;
   b. The Surety is authorized to do business in the State of Florida and has a representative that resides in the State of Florida;
   c. The Surety maintains at least an A- Rating according to A.M. Best Company's most recent Best Key Rating Guide quarterly update;
   d. The Surety's bonding capacity is listed in the Federal Trade Register. State the amount.

5. Work Experience

   If not indicated on AIA Document A305, provide documentation of successful completion of projects of similar size and complexity and on a limited time schedule. Identify at least eight (8) and not more than twelve (12) similar projects completed in the last eight years. Show that you regularly engage in projects in the $1,000,000 to $5,000,000 range. Similar projects are defined as slab-on-grade, reinforced masonry load-bearing walls, wood truss roof structure, stormwater retention ponds, renovation / addition work on occupied sites, and similar construction of comparable complexity for churches or similar entities.

   Provide the following for each project:

   a. Project Name, type, location, general construction type, square footage, photographs, and other pertinent information;
   b. Contract Price and Final Cost;
   c. Contractual Completion Time and Actual Completion Time;
   d. Owner's Representative and phone number;
   e. Project Architect and phone number;
   f. Major Subcontractors

6. Safety Program

   The applicant must demonstrate a good safety record as pertains to its own forces, to subcontracted forces, and to third parties. Include a listing of all OSHA citations, claims filed, etc. that have occurred over the past 5 years' construction activity. Include the OSHA Accident Frequency Rate for the branch submitting the application.

Please see Document 002115 "Instructions for Prequalification" for additional information.

DOCUMENT 002115 - INSTRUCTIONS FOR PREQUALIFICATION

PART 1 - GENERAL

1.1 PURPOSE, LAWS, AND REGULATIONS

A. The purpose of the Prequalification Procedure described in this Document is to provide Owner with a mechanism to evaluate and determine whether Prospective Bidders are qualified to participate in the construction of Project. Evaluation will be limited to that office of the Prospective Bidder that is proposed to perform the Work.

B. Applicable provisions of Federal Procurement Standards are to be observed in the soliciting, receiving, and evaluating of Prospective Bidders' qualifications.

C. Applicable provisions of Federal Procurement Standards are to be observed in bidding, letting, and execution of the Work.

D. Prospective Bidders are required to comply with these Requirements for Prequalification. Only those Prospective Bidders who have complied with the Requirements for Prequalification and have been determined to be qualified will be eligible to submit construction bids on Project.

1.2 DEFINITIONS

A. Financial Statement: The requirement for submitting a financial statement as an attachment to AIA Document A305, "Contractor's Qualification Statement," is understood to mean a certified annual audit, prepared according to generally acceptable accounting practices and signed by an independent certified public accountant. A Reviewed Statement of Assets and Liabilities, prepared and signed by an independent certified public accountant, is also acceptable. A self-prepared annual compiled financial statement or balance sheet is unacceptable.

B. Prospective Bidder: A Prospective Bidder is a person or entity who submits a Submittal of Qualifications to Owner.

C. Project: Generally described in the Advertisement for Prequalification of Bidders .

1.3 PREQUALIFICATION DOCUMENTS

A. Prequalification Documents: Consist of "Advertisement for Bids, Pre-Bid Meeting, and Pre-qualification of Bidders" this "Instructions for Prequalification" Document, and AIA Document A305-2020, "Contractor's Qualification Statement," with required exhibits and additional documents issued by Owner.

1.4 PREQUALIFICATION PROCEDURES

A. Form of Prequalification Submittal:

1. Submittals of Prequalification must be submitted on AIA Document A305-2020, "Contractor's Qualification Statement," properly executed and with all items filled out in ink or typed, and all additional data, attachments, and forms provided. Do not change or add words to the Qualification Statement or forms. All signatures must be original (and sealed if a corporation) and must be notarized and sealed by a Notary Public.

B. Modification to Requirements for Prequalification:

1. Clarifications, alterations, or changes made by Owner to the Requirements for Prequalification are to be in writing only. Verbal information is not valid or binding.
2. Modifications will be mailed or delivered to those Prospective Bidders having obtained Prequalification Documents from the issuing office.

C. Submission of Prequalification Documents:

1. Each Submittal of Prequalification is to be delivered as indicated below on or before the day and hour set for receipt of submittals.
2. Submittal, Electronic Submittal of Prequalification is to be emailed to the Architect at jennifer@jpjarchitect.com . Include as a cover sheet to the submittal file folder:

a. Bidder's Prequalification Statement for Trinity United Methodist Church, Panama City .
b. Prospective Bidder's name.
c. Prospective Bidder's address, phone number, and email address.
d. Contractor's license number.
e. Date and time for submittal.

3. It is the sole responsibility of the Prospective Bidder to ensure that its submittal is received by the submittal date and time. No faxed submittal or modification of a submittal will be considered. No submittal submitted after the time fixed for receiving submittals will be considered; late submittals will be returned to the Prospective Bidder unopened.
4. Owner reserves the right to waive any informality and to request additional information from Prospective Bidders, at Owner's discretion.

D. Attachments:

1. Prospective Bidders are to complete all required forms and attachments described in the Prequalification Documents, entering "Not Applicable" where information does not apply. Absence of any of the forms included in the Prequalification Documents will be reason for possible disqualification.

E. Status of Prospective Bidders:

1. Proprietors submitting bids are to indicate their status as proprietors.

2. Prospective Bidders submitting qualifications for partnerships are to indicate their status as partners and submit a certified copy of the power of attorney authorizing the executor of the submittal to bind the partnership.
3. Prospective Bidders submitting qualifications for corporations are to indicate their status as corporations and submit a certified copy of the board of directors' authorization for the Prospective Bidder to bind the corporation, and affix the corporate seal on the submittal.
4. Prospective Bidders are to provide the following:

    a. Names and addresses of proprietors, of all members of a partnership, or of the corporation's officers.
    b. Name of jurisdiction where the partnership is registered or where the corporation is incorporated. Corporations must be licensed to do business in Project state at the time of executing the Contract.

1.5 WITHDRAWAL

A. A Qualification Statement may be withdrawn on personal request received from the Prospective Bidder.

1.6 PREQUALIFICATION CRITERIA

A. Prospective Bidders must demonstrate the following to the satisfaction of Owner:

1. Proper license under the laws and regulations governing their respective trade(s).
2. Capacity to provide Performance Bond, Labor and Material Payment Bond, and insurance in a form acceptable to Owner in amounts adequate to bond the Work based on the scope indicated in the Advertisement for Prequalification.
3. Applicable experience of firm as described in Contractor's Qualification Statement, including the following:

    a. Experience of Firm: The firm in its current organization must have successfully completed minimum of five projects of similar type, quality, and scope, including a minimum of two within the last five years. The firm must have a record of project completion, credit record, record of judgment claims, arbitration proceedings, and suits pending or outstanding acceptable to Owner.
    b. Experience of Firm Officers: The firm officers must have personal record of project completion acceptable to Owner.
    c. Experience of Project and Field Management Staff to Be Committed by the Prospective Bidder to Carry Out the Work: The assigned project manager and field superintendent must have successfully completed minimum of three projects of similar type, quality, and scope.
    d. For purposes of this submittal, reference to "key individuals," as described in Contractor's Qualification Statement, is to be understood to mean the principal in charge, the project manager(s), and Project field superintendent(s) committed by the Prospective Bidder to carry out the Work of this Project. By submitting qualifications of key individuals, Prospective Bidder agrees that Owner reserves

the right to approve or reject subsequent reassignment of key individuals.

e. For purposes of this submittal, "successful completion" is to be understood to mean completion of Project within Project schedule and budget. Provide additional information indicating reasons why any referenced project did not meet project schedule or project budget.

f. For purposes of this Qualification, "similar project" is to be understood to include the following project elements:

1) Reinforced masonry load-bearing construction.
2) Wood truss roof structure.
3) Renovation/addition work on occupied sites.
4) Stormwater retention ponds.

4. Adequate financial resources, including ability to secure materials and labor necessary for completion of the Work and other work in hand, within the anticipated contract times, and reflecting the anticipated retainage from progress payments.
5. Work-in-hand capacity, such that the Prospective Bidder demonstrates adequate work under contract to continue its business operations at least at their current level, at the same time indicating the capability to carry out Owner's proposed work.
6. Adequate organization to complete work of the scope anticipated, including firm management, project management, field superintendence, and field engineering and quality control.
7. Acceptable past performance as indicated by firm's references, including ability to meet contract time and to monitor, manage, and communicate interim scheduling requirements; carry out required quality-control activities; properly prepare interim and final payment requests; and successfully complete Project closeout requirements.

B. Consideration of qualifications may be withheld if the Qualification Statement shows any unexplained erasures, omissions, alterations of form, additions not called for, added restrictions or qualifying conditions, or other irregularities of any kind.

C. Owner may make such investigations as it deems necessary to determine the ability of the Prospective Bidder to perform the Work, and the Prospective Bidder is to furnish to Owner all such information for this purpose as Owner may request. Owner reserves the right to withhold qualification if the evidence submitted by or investigation of such Prospective Bidder fails to satisfy Owner that such Prospective Bidder is properly qualified to carry out the obligations of the proposed Project. The determination of which Bidders are prequalified is not protestable, except as allowed by law.

D. Prequalification Submittal and data contained therein is considered privileged and confidential and will not be disclosed to any outside party except as required by law.

1.7 BONDS AND INSURANCE

A. The Prospective Bidder is to provide as part of the Submittal of Qualifications evidence of its ability to furnish below:

1. Performance Bond and a Payment Bond, each in the amount of 100 percent of the

Contract Sum, with a corporate surety authorized to transact business in Project's jurisdiction.

2. Satisfactory Certificates of Insurance in the amount and types required by statute, but not less than the following:

    a. Professional design errors and omissions insurance endorsement for delegated design by Contractor's professional engineer.
    b. Workers' Compensation insurance provisions: Statutory limits.
    c. Commercial General Liability insurance provisions: At limits established by Owner in Project Contract Documents

1.8 ACCEPTANCE OF QUALIFICATIONS

A. Prospective Bidders will be notified of Owner's determination, within 14 days from the date of submission.

B. Evaluations will be confidential. Notifications will be publicly available information.

C. Owner may deny prequalification if it finds one or more of the following:

1. The Prospective Bidder does not have sufficient financial capacity to perform the Work.
2. The Prospective Bidder does not have the appropriate experience to perform the Work, including, but not limited to, having met the experience criteria set forth herein.
3. The Prospective Bidder or any officer, director, or owner thereof has had judgments entered against him within the past five years for the breach of contracts for governmental or nongovernmental construction work, including, but not limited to, design-build or construction-management contracts.
4. The Prospective Bidder has been in substantial noncompliance with the terms and conditions of prior construction with Owner, or in documented substantial noncompliance with the terms and conditions of prior construction with another public body without good cause.
5. The Prospective Bidder or any officer, director, owner, or chief financial official thereof has been convicted within the past 10 years of a crime related to governmental or nongovernmental construction or contracting.
6. The Prospective Bidder or any officer, director, or owner thereof is currently debarred pursuant to an established debarment procedure from bidding or contracting by any public body, agency of another state, or agency of the Federal Government.
7. The Prospective Bidder failed to provide to the public body in a timely manner any information required by the public body relevant to the six preceding subparagraphs.
8. The Prospective Bidder provides false, nonresponsive, misleading, or incomplete information for items required herein.

D. The acceptance of a Prospective Bidder's qualifications will be a Notice of Prequalification, signed by a duly authorized representative of Owner; no other act by Owner or its agents will constitute the acceptance of qualifications. The acceptance of a Prospective Bidder's qualifications by Owner does not constitute a contract or promise to award a contract to the Prospective Bidder.

1.9 PROSPECTIVE BIDDER'S CHECKLIST

A. In an effort to assist the Prospective Bidder in properly completing all documentation required, the following checklist is provided for the Prospective Bidder's convenience. The Prospective Bidder is solely responsible for verifying compliance with prequalification requirements.

B. Attach this completed checklist to the outside of the submittal envelope.

1. Reviewed the Prequalification Documents, including the Advertisement for Prequalification, Request for Contractor's Qualifications, and these Instructions for Prequalification, prior to preparing this submittal.
2. Prepared AIA Document A305, "Contractor's Qualification Statement," as required by the document instructions and by the Instructions for Prequalification, including all attachments and data required as part of the Qualification Statement, properly notarized.
3. Attached:

    a. Copy of applicable Contractor's license(s).
    b. Resumes of key individuals.
    c. Other attachments as described or as necessary to provide information required.

4. Cover Sheet shows name and address of the Prospective Bidder.
5. Cover Sheet shows the Prospective Bidder's Contractor's license number.
6. By submitting notarized statement, the Prospective Bidder certifies that the Bidder can provide executed Performance Bond and Labor and Material Bond meeting requirements given in the Requirements for Prequalification.
7. By submitting notarized statement, the Prospective Bidder certifies that the Bidder can provide Certificates of Insurance in the amounts indicated in the Requirements for Prequalification.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF DOCUMENT 002115

AIA® Document A701® – 2018

Instructions to Bidders

for the following Project:
(Name, location, and detailed description)

Church Building Renovation & Addition
4400 W. 19th Street, Panama City, Florida, 32405

THE OWNER:
(Name, legal status, address, and other information)

Trinity United Methodist Church, Inc. Incorporated.
4400 W. 19th Street, Panama City, Florida 32405

THE ARCHITECT:
(Name, legal status, address, and other information)

Jennifer P Jones, Architect, LLC Limited Liability Company
7901 4th St. N., Suite 300
St. Petersburg, FL 33702
251-210-2362

TABLE OF ARTICLES

1 DEFINITIONS

2 BIDDER'S REPRESENTATIONS

3 BIDDING DOCUMENTS

4 BIDDING PROCEDURES

5 CONSIDERATION OF BIDS

6 POST-BID INFORMATION

7 PERFORMANCE BOND AND PAYMENT BOND

8 ENUMERATION OF THE PROPOSED CONTRACT DOCUMENTS

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

FEDERAL, STATE, AND LOCAL LAWS MAY IMPOSE REQUIREMENTS ON PUBLIC PROCUREMENT CONTRACTS. CONSULT LOCAL AUTHORITIES OR AN ATTORNEY TO VERIFY REQUIREMENTS APPLICABLE TO THIS PROCUREMENT BEFORE COMPLETING THIS FORM.

It is intended that AIA Document G612™–2017, Owner's Instructions to the Architect, Parts A and B will be completed prior to using this document.

AIA Document A701 – 2018. Copyright © 1970, 1974, 1978, 1987, 1997 and 2018. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:24:12 ET on 03/03/2026 under Order No.500026793_3 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1462782062)

ARTICLE 1 DEFINITIONS

§ 1.1 Bidding Documents include the Bidding Requirements and the Proposed Contract Documents. The Bidding Requirements consist of the advertisement or invitation to bid, Instructions to Bidders, supplementary instructions to bidders, the bid form, and any other bidding forms. The Proposed Contract Documents consist of the unexecuted form of Agreement between the Owner and Contractor and that Agreement's Exhibits, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, all Addenda, and all other documents enumerated in Article 8 of these Instructions.

§ 1.2 Definitions set forth in the General Conditions of the Contract for Construction, or in other Proposed Contract Documents apply to the Bidding Documents.

§ 1.3 Addenda are written or graphic instruments issued by the Architect, which, by additions, deletions, clarifications, or corrections, modify or interpret the Bidding Documents.

§ 1.4 A Bid is a complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

§ 1.5 The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents, to which Work may be added or deleted by sums stated in Alternate Bids.

§ 1.6 An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from, or that does not change, the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.

§ 1.7 A Unit Price is an amount stated in the Bid as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, as described in the Bidding Documents.

§ 1.8 A Bidder is a person or entity who submits a Bid and who meets the requirements set forth in the Bidding Documents.

§ 1.9 A Sub-bidder is a person or entity who submits a bid to a Bidder for materials, equipment, or labor for a portion of the Work.

ARTICLE 2 BIDDER'S REPRESENTATIONS

§ 2.1 By submitting a Bid, the Bidder represents that:

- **.1** the Bidder has read and understands the Bidding Documents;
- **.2** the Bidder understands how the Bidding Documents relate to other portions of the Project, if any, being bid concurrently or presently under construction;
- **.3** the Bid complies with the Bidding Documents;
- **.4** the Bidder has visited the site, become familiar with local conditions under which the Work is to be performed, and has correlated the Bidder's observations with the requirements of the Proposed Contract Documents;
- **.5** the Bid is based upon the materials, equipment, and systems required by the Bidding Documents without exception; and
- **.6** the Bidder has read and understands the provisions for liquidated damages, if any, set forth in the form of Agreement between the Owner and Contractor.

ARTICLE 3 BIDDING DOCUMENTS

§ 3.1 Distribution

§ 3.1.1 Bidders shall obtain complete Bidding Documents, as indicated below, from the issuing office designated in the advertisement or invitation to bid, for the deposit sum, if any, stated therein.
(Indicate how, such as by email, website, host site/platform, paper copy, or other method Bidders shall obtain Bidding Documents.)

Pre-qualified General Contractors (prime bidders only) may obtain a link from which to download digital (PDF) copies of the Bidding Documents by contacting Ms. Jennifer Jones by email at **jennifer@jpjarchitect.com** or by phone at 251-210-2362. No deposit is required.

AIA Document A701 – 2018. Copyright © 1970, 1974, 1978, 1987, 1997 and 2018. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:24:12 ET on 03/03/2026 under Order No.500026793_3 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1462782062)

(Paragraph deleted)

§ 3.1.3 Bidding Documents will not be issued directly to Sub-bidders unless specifically offered in the advertisement or invitation to bid, or in supplementary instructions to bidders.

§ 3.1.4 Bidders shall use complete Bidding Documents in preparing Bids. Neither the Owner nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete Bidding Documents.

§ 3.1.5 The Bidding Documents will be available for the sole purpose of obtaining Bids on the Work. No license or grant of use is conferred by distribution of the Bidding Documents.

§ 3.2 Modification or Interpretation of Bidding Documents

§ 3.2.1 The Bidder shall carefully study the Bidding Documents, shall examine the site and local conditions, and shall notify the Architect of errors, inconsistencies, or ambiguities discovered and request clarification or interpretation pursuant to Section 3.2.2.

§ 3.2.2 Requests for clarification or interpretation of the Bidding Documents shall be submitted by the Bidder in writing and shall be received by the Architect at least seven days prior to the date for receipt of Bids.
(Indicate how, such as by email, website, host site/platform, paper copy, or other method Bidders shall submit requests for clarification and interpretation.)

Requests for clarification or interpretation shall be made by emailing Ms. Jennifer Jones at jennifer@jpjarchitect.com.

§ 3.2.3 Modifications and interpretations of the Bidding Documents shall be made by Addendum. Modifications and interpretations of the Bidding Documents made in any other manner shall not be binding, and Bidders shall not rely upon them.

§ 3.3 Substitutions

§ 3.3.1 The materials, products, and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance, and quality to be met by any proposed substitution.

§ 3.3.2 Substitution Process

§ 3.3.2.1 Written requests for substitutions shall be received by the Architect at least ten days prior to the date for receipt of Bids. Requests shall be submitted in the same manner as that established for submitting clarifications and interpretations in Section 3.2.2.

§ 3.3.2.2 Bidders shall submit substitution requests on a Substitution Request Form if one is provided in the Bidding Documents.

§ 3.3.2.3 If a Substitution Request Form is not provided, requests shall include (1) the name of the material or equipment specified in the Bidding Documents; (2) the reason for the requested substitution; (3) a complete description of the proposed substitution including the name of the material or equipment proposed as the substitute, performance and test data, and relevant drawings; and (4) any other information necessary for an evaluation. The request shall include a statement setting forth changes in other materials, equipment, or other portions of the Work, including changes in the work of other contracts or the impact on any Project Certifications (such as LEED), that will result from incorporation of the proposed substitution.

§ 3.3.3 The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision of approval or disapproval of a proposed substitution shall be final.

§ 3.3.4 If the Architect approves a proposed substitution prior to receipt of Bids, such approval shall be set forth in an Addendum. Approvals made in any other manner shall not be binding, and Bidders shall not rely upon them.

§ 3.3.5 No substitutions will be considered after the Contract award unless specifically provided for in the Contract Documents.

AIA Document A701 – 2018. Copyright © 1970, 1974, 1978, 1987, 1997 and 2018. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:24:12 ET on 03/03/2026 under Order No.500026793_3 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1462782062)

§ 3.4 Addenda

§ 3.4.1 Addenda will be transmitted to Bidders known by the issuing office to have received complete Bidding Documents.

(Indicate how, such as by email, website, host site/platform, paper copy, or other method Addenda will be transmitted.)

Addenda will be issued to Pre-Qualified General Contractors via email from Ms. Jennifer Jones at jennifer@jpjarchitect.com.

§ 3.4.2 Addenda will be available where Bidding Documents are on file.

§ 3.4.3 Addenda will be issued no later than four days prior to the date for receipt of Bids, except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids.

§ 3.4.4 Prior to submitting a Bid, each Bidder shall ascertain that the Bidder has received all Addenda issued, and the Bidder shall acknowledge their receipt in the Bid.

ARTICLE 4 BIDDING PROCEDURES

§ 4.1 Preparation of Bids

§ 4.1.1 Bids shall be submitted on the forms included with or identified in the Bidding Documents.

§ 4.1.2 All blanks on the bid form shall be legibly executed. Paper bid forms shall be executed in a non-erasable medium.

§ 4.1.3 Sums shall be expressed in both words and numbers, unless noted otherwise on the bid form. In case of discrepancy, the amount entered in words shall govern.

§ 4.1.4 Edits to entries made on paper bid forms must be initialed by the signer of the Bid.

§ 4.1.5 All requested Alternates shall be bid. If no change in the Base Bid is required, enter "No Change" or as required by the bid form.

§ 4.1.6 Where two or more Bids for designated portions of the Work have been requested, the Bidder may, without forfeiture of the bid security, state the Bidder's refusal to accept award of less than the combination of Bids stipulated by the Bidder. The Bidder shall neither make additional stipulations on the bid form nor qualify the Bid in any other manner.

§ 4.1.7 Each copy of the Bid shall state the legal name and legal status of the Bidder. As part of the documentation submitted with the Bid, the Bidder shall provide evidence of its legal authority to perform the Work in the jurisdiction where the Project is located. Each copy of the Bid shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further name the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached, certifying the agent's authority to bind the Bidder.

§ 4.1.8 A Bidder shall incur all costs associated with the preparation of its Bid.

§ 4.2 Bid Security

§ 4.2.1 Each Bid shall be accompanied by the following bid security:

(Insert the form and amount of bid security.)

Bid Bond on Form AIA Document A310-2010 in the amount of 5% of the Bidder's Base Bid.

§ 4.2.2 The Bidder pledges to enter into a Contract with the Owner on the terms stated in the Bid and shall, if required, furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Should the Bidder refuse to enter into such Contract or fail to furnish such bonds if required, the amount of the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty. In the event the Owner fails to comply with Section 6.2, the amount of the bid security shall not be forfeited to the Owner.

AIA Document A701 – 2018. Copyright © 1970, 1974, 1978, 1987, 1997 and 2018. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:24:12 ET on 03/03/2026 under Order No.500026793_3 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1462782062)

§ 4.2.3 If a surety bond is required as bid security, it shall be written on AIA Document A310™, Bid Bond, unless otherwise provided in the Bidding Documents. The attorney-in-fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of an acceptable power of attorney. The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 4.2.4 The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until (a) the Contract has been executed and bonds, if required, have been furnished; (b) the specified time has elapsed so that Bids may be withdrawn; or (c) all Bids have been rejected. However, if no Contract has been awarded or a Bidder has not been notified of the acceptance of its Bid, a Bidder may, beginning 60 days after the opening of Bids, withdraw its Bid and request the return of its bid security.

§ 4.3 Submission of Bids

§ 4.3.1 A Bidder shall submit its Bid as indicated below:
(Indicate how, such as by website, host site/platform, paper copy, or other method Bidders shall submit their Bid.)

Sealed Bids will be received on the date and at the time and place indicated in the Advertisement for Bids unless changed by Addendum issued by the Architect. Bids shall be submitted on a paper copy of the Bid Form included in the Project Manual. Bids may be hand delivered or mailed

§ 4.3.2 Paper copies of the Bid, the bid security, and any other documents required to be submitted with the Bid shall be enclosed in a sealed opaque envelope. The envelope shall be addressed to the party receiving the Bids and shall be identified with the Project name, the Bidder's name and address, and, if applicable, the designated portion of the Work for which the Bid is submitted. If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation "SEALED BID ENCLOSED" on the face thereof.

§ 4.3.3 Bids shall be submitted by the date and time and at the place indicated in the invitation to bid. Bids submitted after the date and time for receipt of Bids, or at an incorrect place, will not be accepted.

§ 4.3.4 The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

§ 4.3.5 A Bid submitted by any method other than as provided in this Section 4.3 will not be accepted.

§ 4.4 Modification or Withdrawal of Bid

§ 4.4.1 Prior to the date and time designated for receipt of Bids, a Bidder may submit a new Bid to replace a Bid previously submitted, or withdraw its Bid entirely, by notice to the party designated to receive the Bids. Such notice shall be received and duly recorded by the receiving party on or before the date and time set for receipt of Bids. The receiving party shall verify that replaced or withdrawn Bids are removed from the other submitted Bids and not considered. Notice of submission of a replacement Bid or withdrawal of a Bid shall be worded so as not to reveal the amount of the original Bid.

§ 4.4.2 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids in the same format as that established in Section 4.3, provided they fully conform with these Instructions to Bidders. Bid security shall be in an amount sufficient for the Bid as resubmitted.

§ 4.4.3 After the date and time designated for receipt of Bids, a Bidder who discovers that it made a clerical error in its Bid shall notify the Architect of such error within two days, or pursuant to a timeframe specified by the law of the jurisdiction where the Project is located, requesting withdrawal of its Bid. Upon providing evidence of such error to the reasonable satisfaction of the Architect, the Bid shall be withdrawn and not resubmitted. If a Bid is withdrawn pursuant to this Section 4.4.3, the bid security will be attended to as follows:
(State the terms and conditions, such as Bid rank, for returning or retaining the bid security.)

The bid security shall be returned. No bidder who is permitted to withdraw a bid shall, for compensation, supply any material or labor to or perform any subcontract or other work agreement for the company or firm to whom the contract is awarded or otherwise benefit, directly or indirectly, from the performance of the project for which the withdrawn bid was submitted. If the Architect denies a request to withdraw a bid due to a clerical error, the bid security will be retained.

AIA Document A701 – 2018. Copyright © 1970, 1974, 1978, 1987, 1997 and 2018. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:24:12 ET on 03/03/2026 under Order No.500026793_3 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1462782062)

ARTICLE 5 CONSIDERATION OF BIDS

§ 5.1 Opening of Bids

If stipulated in an advertisement or invitation to bid, or when otherwise required by law, Bids properly identified and received within the specified time limits will be publicly opened and read aloud. A summary of the Bids may be made available to Bidders.

§ 5.2 Rejection of Bids

Unless otherwise prohibited by law, the Owner shall have the right to reject any or all Bids.

§ 5.3 Acceptance of Bid (Award)

§ 5.3.1 It is the intent of the Owner to award a Contract to the lowest responsive and responsible Bidder, provided the Bid has been submitted in accordance with the requirements of the Bidding Documents. Unless otherwise prohibited by law, the Owner shall have the right to waive informalities and irregularities in a Bid received and to accept the Bid which, in the Owner's judgment, is in the Owner's best interests.

§ 5.3.2 Unless otherwise prohibited by law, the Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the lowest responsive and responsible Bidder on the basis of the sum of the Base Bid and Alternates accepted.

ARTICLE 6 POST-BID INFORMATION

§ 6.1 Contractor's Qualification Statement

Bidders to whom award of a Contract is under consideration shall submit to the Architect, upon request and within the timeframe specified by the Architect, a properly executed AIA Document A305™, Contractor's Qualification Statement, unless such a Statement has been previously required and submitted for this Bid.

§ 6.2 Owner's Financial Capability

A Bidder to whom award of a Contract is under consideration may request in writing, fourteen days prior to the expiration of the time for withdrawal of Bids, that the Owner furnish to the Bidder reasonable evidence that financial arrangements have been made to fulfill the Owner's obligations under the Contract. The Owner shall then furnish such reasonable evidence to the Bidder no later than seven days prior to the expiration of the time for withdrawal of Bids. Unless such reasonable evidence is furnished within the allotted time, the Bidder will not be required to execute the Agreement between the Owner and Contractor.

§ 6.3 Submittals

§ 6.3.1 After notification of selection for the award of the Contract, the Bidder shall, as soon as practicable or as stipulated in the Bidding Documents, submit in writing to the Owner through the Architect:

- **.1** a designation of the Work to be performed with the Bidder's own forces;
- **.2** names of the principal products and systems proposed for the Work and the manufacturers and suppliers of each; and
- **.3** names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for the principal portions of the Work.

§ 6.3.2 The Bidder will be required to establish to the satisfaction of the Architect and Owner the reliability and responsibility of the persons or entities proposed to furnish and perform the Work described in the Bidding Documents.

§ 6.3.3 Prior to the execution of the Contract, the Architect will notify the Bidder if either the Owner or Architect, after due investigation, has reasonable objection to a person or entity proposed by the Bidder. If the Owner or Architect has reasonable objection to a proposed person or entity, the Bidder may, at the Bidder's option, withdraw the Bid or submit an acceptable substitute person or entity. The Bidder may also submit any required adjustment in the Base Bid or Alternate Bid to account for the difference in cost occasioned by such substitution. The Owner may accept the adjusted bid price or disqualify the Bidder. In the event of either withdrawal or disqualification, bid security will not be forfeited.

§ 6.3.4 Persons and entities proposed by the Bidder and to whom the Owner and Architect have made no reasonable objection must be used on the Work for which they were proposed and shall not be changed except with the written consent of the Owner and Architect.

AIA Document A701 – 2018. Copyright © 1970, 1974, 1978, 1987, 1997 and 2018. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:24:12 ET on 03/03/2026 under Order No.500026793_3 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1462782062)

ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND

§ 7.1 Bond Requirements

§ 7.1.1 If stipulated in the Bidding Documents, the Bidder shall furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder.

§ 7.1.2 If the furnishing of such bonds is stipulated in the Bidding Documents, the cost shall be included in the Bid. If the furnishing of such bonds is required after receipt of bids and before execution of the Contract, the cost of such bonds shall be added to the Bid in determining the Contract Sum.

§ 7.1.3 The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 7.1.4 Unless otherwise indicated below, the Penal Sum of the Payment and Performance Bonds shall be the amount of the Contract Sum.
(If Payment or Performance Bonds are to be in an amount other than 100% of the Contract Sum, indicate the dollar amount or percentage of the Contract Sum.)

§ 7.2 Time of Delivery and Form of Bonds

§ 7.2.1 The Bidder shall deliver the required bonds to the Owner not later than three days following the date of execution of the Contract. If the Work is to commence sooner in response to a letter of intent, the Bidder shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished and delivered in accordance with this Section 7.2.1.

§ 7.2.2 Unless otherwise provided, the bonds shall be written on AIA Document A312, Performance Bond and Payment Bond.

§ 7.2.3 The bonds shall be dated on or after the date of the Contract.

§ 7.2.4 The Bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix to the bond a certified and current copy of the power of attorney.

ARTICLE 8 ENUMERATION OF THE PROPOSED CONTRACT DOCUMENTS

§ 8.1 Copies of the proposed Contract Documents have been made available to the Bidder and consist of the following documents:

.1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor, unless otherwise stated below.
(Insert the complete AIA Document number, including year, and Document title.)

.2 AIA Document A101™–2017, Exhibit A, Insurance and Bonds, unless otherwise stated below.
(Insert the complete AIA Document number, including year, and Document title.)

.3 AIA Document A201™–2017, General Conditions of the Contract for Construction, unless otherwise stated below.
(Insert the complete AIA Document number, including year, and Document title.)

.4

.5 Drawings

AIA Document A701 – 2018. Copyright © 1970, 1974, 1978, 1987, 1997 and 2018. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:24:12 ET on 03/03/2026 under Order No.500026793_3 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1462782062)

.6 Specifications

.7 Addenda:

.8 Other Exhibits:
(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

(Paragraphs deleted)

[**.1**] Supplementary and other Conditions of the Contract:

Document	**Title**
Section 007400	Special Conditions

.9 Other documents listed below:
(List here any additional documents that are intended to form part of the Proposed Contract Documents.)

AIA Document A701 – 2018. Copyright © 1970, 1974, 1978, 1987, 1997 and 2018. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:24:12 ET on 03/03/2026 under Order No.500026793_3 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1462782062)

DOCUMENT 002513 - PREBID MEETINGS

PART 1 - GENERAL

1.1 PREBID MEETING

A. Architect will conduct a prebid meeting as indicated below:

1. Meeting Date: Tuesday, March 10, 2026.
2. Meeting Time: 10:00 am, local time.
3. Location, In-Person Meeting: Conference Room of Trinity United Methodist Church, 4400 W. 19th Street, Panama City, FL 32405.
4. Information provided during Prebid Meeting does not constitute a modification to the Procurement and Contracting Documents. Modifications to the Procurement and Contracting Documents are issued by written Addendum only.

B. Attendance:

1. Prime Bidders: Attendance at Prebid Meeting is mandatory.
2. Subcontractors: Attendance at Prebid Meeting is recommended.
3. Notice: Bids will only be accepted from prime bidders represented on Prebid Meeting sign-in sheet.

C. Bidder Questions: Submit written questions to be addressed at Prebid Meeting minimum of two business days prior to meeting.

D. Agenda: Prebid Meeting agenda will include review of topics that may affect proper preparation and submittal of bids, including the following:

1. Procurement and Contracting Requirements:

a. Advertisement for Bids.
b. Instructions to Bidders.
c. Bidder qualifications.
d. Bonding.
e. Insurance.
f. Bid security.
g. Bid Form and attachments.
h. Bid submittal requirements.
i. Bid Submittal Checklist.
j. Notice of Award.

2. Communication during Bidding Period:

a. Obtaining documents.
b. Bidder's Requests for Information.

c. Bidder's Substitution Request/Prior Approval Request.
d. Addenda.

3. Contracting Requirements:

a. Agreement.
b. The General Conditions.
c. The Supplementary Conditions.
d. Other Owner requirements.
e. FEMA Requirements / Contract Provisions.

4. Construction Documents:

a. Scope of Work.
b. Temporary facilities.
c. Use of site.
d. Work restrictions.
e. Alternates, allowances.
f. Substitutions following award.

5. Schedule:

a. Project schedule.
b. Contract Time.
c. Liquidated damages.
d. Other Bidder questions.

6. Site/facility visit or walkthrough.
7. Post-meeting addendum.

E. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes to attendees . Minutes of meeting are issued as Available Information and do not constitute a modification to the Procurement and Contracting Documents. Modifications to the Procurement and Contracting Documents are issued by written Addendum only.

1. Sign-in Sheet: Minutes will include list of meeting attendees.

1.2 SITE WALKTHROUGH

A. Site walkthrough will be conducted by members of Project team following the Prebid Meeting.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF DOCUMENT 002513

DOCUMENT 002600 - PROCUREMENT SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 DEFINITIONS

A. Procurement Substitution Requests: Requests for changes in products, materials, equipment, and methods of construction from those indicated in the Procurement and Contracting Documents, submitted prior to receipt of bids in accordance with Instructions to Bidders.

B. Procurement Prior Approval Requests: Requests for approval of products or manufacturers from those required by the Contract Documents as defined by product selection procedures in Section 016000 "Product Requirements."

1. Procurement prior approval is required when products or manufacturers are listed in specifications under "Sole Product," "Sole Manufacturer," "Limited List of Products," or "Limited List of Manufacturers" introductory paragraphs.
2. Procurement prior approval is not required when products or manufacturers are listed in specifications under "Non-Limited List of Products" or "Non-Limited List of Manufacturers" introductory paragraphs.
3. Where use of "Sole Product," "Sole Manufacturer," "Limited List of Products," or "Limited List of Manufacturers" introductory paragraphs is not allowed by statute, procurement prior approval request is not required.

C. Substitution Requests: Requests for changes in products, materials, equipment, and methods of construction from those indicated in the Contract Documents, submitted following Contract award. See the General Conditions and Section 012500 "Substitution Procedures" for conditions under which Substitution requests will be considered following Contract award.

1.2 QUALITY ASSURANCE

A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.3 PROCUREMENT SUBSTITUTIONS

A. Procurement Substitutions, General: By submitting a bid, the Bidder represents that its bid is based on materials and equipment described in the Procurement and Contracting Documents, including Addenda. Bidders are encouraged to request approval of qualifying substitute materials and equipment when the Specifications Sections list materials and equipment by product or manufacturer name.

B. Procurement Substitution Requests will be received and considered by Owner when the

following conditions are satisfied, as determined by Architect; otherwise requests will be returned without action:

1. Extensive revisions to the Contract Documents are not required.
2. Proposed changes are in keeping with general intent of the Contract Documents, including level of quality of the Work represented by requirements therein.
3. Request is fully documented and properly submitted.

1.4 SUBMITTALS

A. Procurement Substitution Request: Submit to [**Architect**][**Construction Manager**]. Procurement Substitution Request must be made in writing [**by prime contract Bidder only**] in compliance with the following requirements:

1. Requests for substitution of materials and equipment will be considered if received no later than [**10**]<**Insert number**> days prior to date of bid opening.
2. Submittal Format, Printed: Submit [**three**]<**Insert number**> copies of each written Procurement Substitution Request, using [**form bound in Project Manual**][**or**][**CSI Substitution Request Form 1.5C**].
3. Submittal Format, Electronic: Submit Procurement Substitution Request, using format provided on Project web-based bidding management software site.

    a. Identify the product or the fabrication or installation method to be replaced in each request. Include related Specifications Sections and Drawing numbers.
    b. Provide complete documentation on both the product specified and the proposed substitute, including the following information as appropriate:

        1) List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.
        2) Product data, including drawings and descriptions of products and fabrication and installation procedures.
        3) Point-by-point comparison of specified and proposed substitute product data, fabrication drawings, and installation procedures.
        4) Copies of current, independent third-party test data of salient product or system characteristics.
        5) Samples where applicable or when requested by Architect.
        6) Detailed comparison of significant qualities of proposed substitute with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
        7) Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
        8) Research reports, where applicable, evidencing compliance with building code in effect for Project, from [**ICC-ES**]<**Insert applicable code organization**>.
        9) Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by

Owner and separate contractors, which will become necessary to accommodate proposed substitute.

c. Provide certification by manufacturer that proposed substitute is equal to or superior to that required by the Procurement and Contracting Documents, and that its in-place performance will be equal to or superior to product or equipment specified in the application indicated.
d. Bidder, in submitting the Procurement Substitution Request, waives the right to additional payment or an extension of Contract Time because of the failure of substitute to perform as represented in the Procurement Substitution Request.

B. Architect's Action:

1. Architect may request additional information or documentation necessary for evaluation of the Procurement Substitution Request. Architect will notify all Bidders of acceptance of proposed substitute by means of an Addendum to the Procurement and Contracting Documents.

C. Architect's approval of substitute during bidding does not relieve Contractor of the responsibility to submit required Shop Drawings and to comply with all other requirements of the Contract Documents.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF DOCUMENT 002600

DOCUMENT 003119 - EXISTING CONDITION INFORMATION

PART 1 - GENERAL

1.1 EXISTING CONDITION INFORMATION

A. This Document with its referenced attachments is part of the Procurement and Contracting Requirements for Project. They provide Owner's information for Bidders' convenience and are intended to supplement rather than serve in lieu of the Bidders' own investigations. They are made available for Bidders' convenience and information. This Document and its attachments are not part of the Contract Documents.

B. Survey information that includes information on existing conditions, prepared by Buchanan & Harper, Inc., dated 9/19/2024, is available for viewing by contacting the Architect .

C. Related Requirements:

1. Document 003132 "Geotechnical Data" for reports and soil-boring data from geotechnical investigations that are made available to Bidders.
2. Document 002513 "Prebid Meetings" for site walkthrough.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF DOCUMENT 003119

DOCUMENT 003132 - GEOTECHNICAL DATA

PART 1 - GENERAL

1.1 GEOTECHNICAL DATA

A. This Document, with its referenced attachments, is part of the Procurement and Contracting Requirements for the Project. They provide Owner's information for Bidders' convenience and are intended to supplement rather than serve in lieu of Bidders' own investigations. They are made available for Bidders' convenience and information. This Document and its attachments are not part of the Contract Documents.

B. Because subsurface conditions indicated by the soil borings are a sampling in relation to the entire construction area, and for other reasons, Owner, Architect, Architect's consultants, and the firm reporting the subsurface conditions do not warranty the conditions below the depths of the borings or that the strata logged from the borings are necessarily typical of the entire site. Any party using the information described in the soil borings and geotechnical report accepts full responsibility for its use.

C. Soil-Boring Data for Project, obtained by Magnum Engineering, Inc., dated September 30. 2024, is available for viewing as appended to this Project Manual.

D. A Geotechnical Investigation Report for Project, prepared by Magnum Engineering, Inc., dated October 1, 2024, is available for viewing as appended to this Project Manual.

1. The opinions expressed in this report are those of a geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by a geotechnical engineer. Owner is not responsible for interpretations or conclusions drawn from the data.
2. Any party using information described in the geotechnical report will make additional test borings and conduct other exploratory operations that may be required to determine the character of subsurface materials that may be encountered.

E. Related Requirements:

1. Document 002113 "Instructions to Bidders" for the Bidder's responsibilities for examination of Project site and existing conditions.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF DOCUMENT 003132



MAGNUM ENGINEERING INC

GEOTECHNICAL ENGINEERING CONSULTANTS

GEOTECHNICAL ENGINEERING REPORT

TRINITY UMC
PANAMA CITY, FLORIDA

PREPARED FOR:

ANCHOR CEI
450 MAGNOLIA AVENUE
PANAMA CITY, FLORIDA 32401

429 FLORIDA AVENUE
LYNN HAVEN, FLORIDA 32444
TELEPHONE (850) 258.0994

MAGNUM ENGINEERING INC
GEOTECHNICAL ENGINEERING
CONSULTANTS

October 1, 2024

Mrs. Brittany Trumbull, P.E.
Anchor CEI
450 Magnolia Avenue
Panama City, Florida 32401

SUBJECT: Trinity UMC - Geotechnical Services for Pavement and Stormwater
Panama City, Florida
MEI Project No. M124-120-917

Dear Mrs. Trumbull:

This letter forwards the results of our Geotechnical services for the proposed development in Panama City, Florida. The purpose of this exploration was to evaluate the subsurface conditions present in the proposed pavement and stormwater treatment area(s).

Project Description and Scope of Services

The subject site is located at 4400 W. 19th Street which is north of W. 19th Street, east of Lombardy Avenue, and west of Danford Avenue in Panama City, Florida. At the time of our investigation, the site was developed with an existing church and gravel parking lot.

Our exploration consisted of Four (4) 4-feet to 5-feet deep hand auger borings and one (1) Double Ring Infiltrometer Test (DRI). Upon completion of our field testing, the samples were brought back to the office for lab testing, visual inspection, classification and analysis by our engineering staff.

If any of the above information is incorrect, please inform Magnum Engineering, Inc. so that we can review and update our recommendations, as needed.

The scope of services did not include an environmental assessment for determining the presence or absence of wetlands or hazardous materials in the air, surface water(s), soil, or groundwater on or in the vicinity of the subject site.

Subsurface Conditions

Figure #1 shows the Boring Location Plan and Figure #2 shows the Logs of Borings for HA-1 through HA-4. The test locations were identified in the field using the provided site plan, a measuring wheel, and estimating right angles with reference to existing landmarks. Therefore, the test locations should be considered approximate.

The auger borings generally encountered slightly silty fine sands from the ground surface to the boring termination depths 4-feet to 5-feet below existing grade with the exception of silty fine sands encountered in boring HA-1 from 3.5 feet to 5 feet below existing grade. Additionally, a hardpan layer was encountered in boring HA-1 from 1.5 feet to 1.7 feet below existing grade and in boring HA-4 from 1.0 feet to 1.3 feet below existing grade.

The above subsurface descriptions are of a generalized nature, provided to highlight the major soil strata encountered. The Logs of Borings should be reviewed for specific subsurface conditions at each boring location. The stratifications shown on the Logs of Boring represent the subsurface conditions at the actual boring locations only, and variations in the subsurface conditions can and may occur between boring locations and should therefore be expected. The stratifications represent the approximate boundary between subsurface materials, and the transitions between strata may be gradual. Please refer to the attached logs of borings presented as Figure #2 for a more detailed description of the soils encountered.

Groundwater Conditions

At the time of our exploration (September 30, 2024), groundwater was encountered between 1.6 feet and 4.6 feet below existing grade, which was during a period of normal seasonal rainfall and immediately following a significant rainfall event. By definition, the normal seasonal high groundwater table elevation is the highest level of the saturated zone in the soil during a year with normal rainfall. The procedure used in estimating the seasonal high groundwater table is based on adjusting the existing groundwater table encountered upward or downward, taking into consideration factors such as antecedent rainfall, redoximorphic features (identifying soil mottling) and vegetative indicators. **We have estimated the seasonal high groundwater table at the boring location. Please refer to the table provided below for groundwater data.**

TABLE #1

Location	Groundwater Depth Below Existing Grade	Estimated Seasonal High Groundwater Depth Below Existing Grade
HA-1	3.3 feet	2.0 feet
HA-2	4.6 feet	3.2 feet
HA-3	1.6 feet	0.5 feet
HA-4	1.9 feet	0.7 feet

Large fluctuations are possible under severe weather conditions. We recommend that the Contractor verify the actual groundwater levels at the time of construction to determine potential impacts groundwater will have on construction procedures.

Double Ring Infiltrometer Test

One (1) Double Ring Infiltrometer test was performed in the field in general accordance with the procedures outlined in ASTM D-3385, ``Infiltration Rate of Soils in Field using Double Ring Infiltrometers''. Testing consisted of initially clearing all surface vegetation and topsoil from within the test area. The Infiltration test was performed approximately 0.5 feet below existing grade at location DRI-1. The outer ring, which is approximately 24 inches in diameter, was then driven to a depth of 6 inches below the exposed ground surface. The inner ring, approximately 12 inches in diameter, was then centrally located within the outer ring and driven to a depth of 2 inches. The two rings were then simultaneously filled with water to a height of 4 inches above the exposed ground surface test soils. The water level was maintained at this height throughout the test period, with the required amount of water added to maintain this level in both rings recorded at time intervals of 5 minutes.

The infiltration rate for the inner ring and the annular space between the rings is determined by dividing (a) the water volume used (within each specific area) during the stabilized flow period of the test, by (b) the specific area and (c) the time interval. Infiltration rates are generally converted to units of inches per hour. The infiltration rate for the inner ring, if different than the infiltration rate of the annular area between the rings, according to ASTM, should be used as the infiltration rate for the soils.

INFILTRATION DATA

LOCATION	ORIENTATION	TEST DEPTH (feet)	SUSTAINED INFILTRATION RATE (in/hr)
DRI-1	$K_{V\ (unsaturated)}$	0.5	20.7*

Note: The above infiltration rate has not been factored and is up to the designer to apply an appropriate factor of safety.

We recommend using a transformation ratio of 1 horizontal to 1 vertical (i.e. the estimated ratio of horizontal to vertical permeability).

ENVIRONMENTAL RESOURCE PERMITTING (ERP) DESIGN PARAMETERS

DESCRIPTION	LOCATION	DESIGN PARAMTER
SUSTAINED INFILTRATION RATE (K_{VU})	DRI-1	20.7 IN/HR*
TEST DEPTH	DRI-1	0.5 feet
FILLABLE POROSITY	DRI-1	30%
DEPTH TO EXISTING GROUNDWATER TABLE	DRI-1	1.6 FT BELOW EXISTING GRADE
DEPTH TO ESTIMATED SEASONAL HIGH GROUNDWATER TABLE	DRI-1	0.5 FT BELOW EXISTING GRADE

***** The above infiltration rate has not been factored and it is up to the designer to apply an appropriate factor of safety.

Pavement Recommendations

The site should be cleared and grubbed of surface vegetation and all remaining deleterious materials present on site. As a minimum, it is recommended the clearing operations extend at least five feet beyond the development perimeters. We anticipate 6 inches to 12 inches of surficial grubbing will be needed.

Prior to placing fill soils, where applicable, the top of the ground surface should be compacted to a minimum soil density of 95% of the Modified Proctor Test (ASTM D1557). Structural fill soils should be placed in maximum 12-inch lifts and compacted to a minimum soil density of 95% of the Modified Proctor Test (ASTM D1557). The top 12 inches of subgrade should be compacted to a minimum soil density of 98% of the Modified Proctor Test (ASTM D1557). The top 12 inches of subgrade should have a minimum LBR value of 40. We recommend that structural fill soils, where planned, have a minimum LBR of 40.

Based on the subsurface conditions encountered in the test borings, we recommend using a graded aggregate base (i.e. limerock or crushed concrete). The base course should be compacted to a minimum soil density of 98% of the Modified Proctor Test (ASTM D1557).

Without the benefit of traffic loads, volumes, and serviceability parameters, a pavement section cannot be designed. However, typical pavement in the local area generally consist of a minimum of 1½ inches of FDOT Superpave Mix SP-12.5 or SP-9.5 asphaltic concrete and a minimum of 6 inches of base. Moderate duty traffic areas (e.g. main entrance areas) typically have a minimum pavement section consisting of 2 inches of FDOT Superpave Mix SP-12.5 asphaltic concrete and 8 inches of base. The above sections represent minimum thicknesses representative of typical, local construction practices, and as such periodic maintenance should be anticipated. All pavement materials and construction procedures should conform to FDOT and/or appropriate city or county requirements

While specific traffic loads and volumes for the project have not been provided, we are providing recommended light-duty and medium-duty pavement sections, which have been successfully utilized for this type of commercial development in the Northwest Florida area.

Light Duty (General pavement areas)

- 1 ½ inches Asphalt Concrete (FDOT Superpave Mix SP-12.5 or SP-9.5)
- 6 inches Crushed Limerock or Graded Aggregate Base
- 12 inches stabilized subgrade (minimum LBR 40)

Medium Duty(Entrance Lanes, Dumpster Pads)

- 2 inches Asphaltic Concrete (FDOT Superpave Mix SP-12.5)
- 8 inches Crushed Limerock or Graded Aggregate Base
- 12 inches Stabilized Subgrade (minimum LBR 40)

The above recommended pavement sections represent minimum design thicknesses and, as such, periodic maintenance should be anticipated. Also, these recommended pavement sections should be confirmed or modified by your Civil Engineer, based on actual traffic and the owner's requirements. The pavement section materials and construction should comply with the Florida DOT and local municipality requirements.

If the seasonal high groundwater level will be less than 24 inches below the bottom of the base course, we recommend the medium duty pavement section be used.

Warranty and Limitations of Study

Our professional services have been performed, our findings obtained, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. This warranty is in lieu of all other warranties, either expressed or implied. Magnum Engineering, Inc. is not responsible for the independent conclusions, opinions or recommendations made by others based on the field exploration and laboratory test data presented in this report.

We wish to point out that a geotechnical study is inherently limited in that the engineering recommendations are developed from information obtained from test borings that only depict subsurface conditions at the specific locations, times and depth shown on the logs. Soil conditions at other locations may differ from those encountered in the test borings, and the passage of time may cause the soils conditions to change from those described in this report.

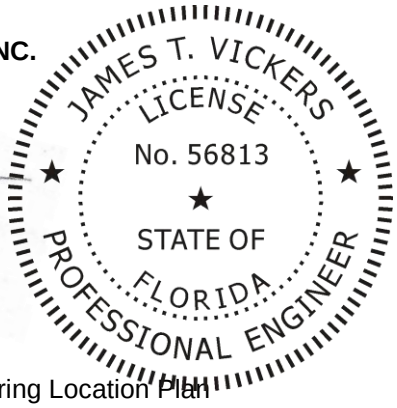
This report is intended for use by the designers of this project. While we have no objections to it being provided for review by parties to this project, it is not a specification document and is not to be used as a part of the specifications. If desired, we can assist in the development of specifications for this project based upon our exploration.

The nature and extent of variation and change in the subsurface conditions at the site may not become evident until the course of construction. Construction monitoring by the geotechnical engineer or his representative is therefore considered necessary to verify the subsurface conditions. If significant variations or changes are in evidence, it may be necessary to reevaluate the recommendations in this report.

Furthermore, if the project characteristics are altered significantly from those discussed in this report, if the project information contained in this report is incorrect or if additional information becomes available, a review must be made by this office to determine if any modifications in the recommendations will be necessary.

We hope this letter provides sufficient information for the present. If you have any questions or comments, please feel free to call.

Sincerely,
MAGNUM ENGINEERING. INC.



JAMES T. VICKERS, P.E.
Sr. Geotechnical Engineer
Florida Registration # 56813

Attachments: Figure #1 – Boring Location Plan
Figure #2 – Logs of Borings
Appendix (A) – Double Ring Infiltrometer Test Results

This item has been digitally signed and sealed by James T. Vickers, P.E. on 10/1/2024.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies

MAGNUM ENGINEERING INC

GEOTECHNICAL ENGINEERING CONSULTANTS

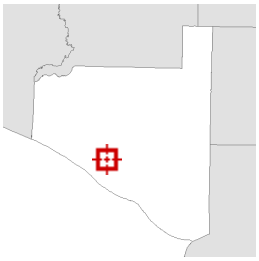
BORING LOCATION PLAN

FIGURE # 1

Bay County Property Appraiser - Dan Sowell, CFA
Main Office | 860 W. 11th St, Panama City, FL 32401 | 850-248-8401
Beach Office | 301 Richard Jackson Blvd, Panama City Beach, FL 32407 | 850-248-8470



Overview



Legend

Parcels

Parcel ID	28088-000-000	**Owner**	ST MARK METHODIST CHURCH	**Last 2 Sales**			
Class Code	CHURCHES		4400 W 19TH ST	**Date**	**Price**	**Reason**	**Qual**
Taxing District	16		PANAMA CITY, FL 32405-1106	n/a	0	n/a	n/a
	PANAMA CITY	**Physical Address**	4400 19TH ST W	n/a	0	n/a	n/a
Acres	1.275	**Just Value**	Value $214242	**MLS**			

(Note: Not to be used on legal documents)

Maps have been compiled from the most authentic information available and are to be used for assessment purposes only. Bay County Property Appraiser's Office assumes NO responsibility for errors and/or omissions that may be contained herein. THIS MAP IS NOT A SURVEY

Date created: 9/18/2024
Last Data Uploaded: 9/18/2024 7:14:47 AM

Developed by Schneider GEOSPATIAL

MAGNUM ENGINEERING INC

GEOTECHNICAL ENGINEERING CONSULTANTS

LOGS OF BORINGS

FIGURE # 2

Magnum Engineering, Inc.
429 Florida Avenue
Lynn Haven, Florida 32444
Telephone: 8502658332

BORING NUMBER HA-1

CLIENT Alabama-West Florida Conference of the United Methodist Church **PROJECT NAME** Trinity UMC

PROJECT NUMBER M124-120-917 **PROJECT LOCATION** Panama City, Florida

DATE STARTED 9/30/24 **COMPLETED** 9/30/24 **GROUND ELEVATION** _____ **HOLE SIZE** _____

DRILLING CONTRACTOR _____ **GROUND WATER LEVELS:**

DRILLING METHOD Hand Auger Boring ▽ **DEPTH TO GROUNDWATER AT TIME OF DRILLING** 3.3 ft

LOGGED BY B. Vickers **CHECKED BY** J. Vickers **ESTIMATED SEASONAL HIGH GWT** ---

NOTES _____ **AFTER DRILLING** ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		Light Gray Slightly Silty Fine SAND (SP-SM)										
		Dark Brown Slightly Silty Fine SAND (Hardpan Type) (SP-SM)										
		Brown/Tan Slightly Silty Fine SAND (SP-SM)										
2.5		▽	AU									
		Gray Silty Fine SAND (SM)										
5.0		Boring Termination Depth at 5.0 feet.										

GEOTECH BH COLUMNS TRINITY UMC.GPJ GINT STD US LAB.GDT 10/1/24

Magnum Engineering, Inc.
429 Florida Avenue
Lynn Haven, Florida 32444
Telephone: 8502658332

BORING NUMBER HA-2

CLIENT Alabama-West Florida Conference of the United Methodist Church **PROJECT NAME** Trinity UMC

PROJECT NUMBER M124-120-917 **PROJECT LOCATION** Panama City, Florida

DATE STARTED 9/30/24 **COMPLETED** 9/30/24 **GROUND ELEVATION** _____ **HOLE SIZE** _____

DRILLING CONTRACTOR _____ **GROUND WATER LEVELS:**

DRILLING METHOD Hand Auger Boring ▽ **DEPTH TO GROUNDWATER AT TIME OF DRILLING** 4.6 ft

LOGGED BY B. Vickers **CHECKED BY** J. Vickers **ESTIMATED SEASONAL HIGH GWT** ---

NOTES _____ **AFTER DRILLING** ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		Gray Slightly Silty Fine SAND (SP-SM)										
		Tan Slightly Silty Fine SAND (SP-SM)										
2.5			AU									
		Light Tan Slightly Silty Fine SAND (SP-SM)										
		▽										
5.0		Boring Termination Depth at 5.0 feet.										

GEOTECH BH COLUMNS TRINITY UMC.GPJ GINT STD US LAB.GDT 10/1/24

Magnum Engineering, Inc.
429 Florida Avenue
Lynn Haven, Florida 32444
Telephone: 8502658332

BORING NUMBER HA-3

CLIENT Alabama-West Florida Conference of the United Methodist Church **PROJECT NAME** Trinity UMC

PROJECT NUMBER M124-120-917 **PROJECT LOCATION** Panama City, Florida

DATE STARTED 9/30/24 **COMPLETED** 9/30/24 **GROUND ELEVATION** _____ **HOLE SIZE** _____

DRILLING CONTRACTOR _____ **GROUND WATER LEVELS:**

DRILLING METHOD Hand Auger Boring ▽ **DEPTH TO GROUNDWATER AT TIME OF DRILLING** 1.6 ft

LOGGED BY B. Vickers **CHECKED BY** J. Vickers **ESTIMATED SEASONAL HIGH GWT** ---

NOTES _____ **AFTER DRILLING** ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		Tan Slightly Silty Fine SAND (SP-SM)	AU									
		Gray Slightly Silty Fine SAND (SP-SM)										
		▽ Brown Slightly Silty Fine SAND (SP-SM)										
2.5		Dark Gray/Dark Brown Slightly Silty Fine SAND (SP-SM)										
		Boring Termination Depth at 4.5 feet.										

Magnum Engineering, Inc.
429 Florida Avenue
Lynn Haven, Florida 32444
Telephone: 8502658332

BORING NUMBER HA-4

CLIENT Alabama-West Florida Conference of the United Methodist Church **PROJECT NAME** Trinity UMC

PROJECT NUMBER M124-120-917 **PROJECT LOCATION** Panama City, Florida

DATE STARTED 9/30/24 **COMPLETED** 9/30/24 **GROUND ELEVATION** _____ **HOLE SIZE** _____

DRILLING CONTRACTOR _____ **GROUND WATER LEVELS:**

DRILLING METHOD Hand Auger Boring ▽ **DEPTH TO GROUNDWATER AT TIME OF DRILLING** 1.9 ft

LOGGED BY B. Vickers **CHECKED BY** J. Vickers **ESTIMATED SEASONAL HIGH GWT** ---

NOTES _____ **AFTER DRILLING** ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		Gray Slightly Silty Fine SAND (SP-SM)										
		Brown Slightly Silty Fine SAND (Hardpan Type) (SP-SM)										
		Tan/Light Tan Slightly Silty Fine SAND (SP-SM)										
		▽	AU									
2.5												
		Boring Termination Depth at 4.0 feet.										

GEOTECH BH COLUMNS TRINITY UMC.GPJ GINT STD US LAB.GDT 10/1/24

MAGNUM ENGINEERING INC
GEOTECHNICAL ENGINEERING
CONSULTANTS

Double Ring Infiltrometer Test Results

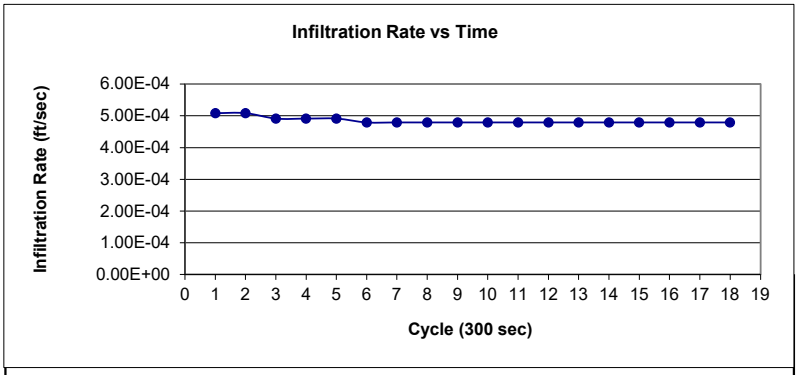
Appendix (A)

MAGNUM ENGINEERING INC
GEOTECHNICAL ENGINEERING CONSULTANTS

Double-Ring Field Infiltration Test

Test Location:	DRI-1		
Project Name:	Trinity UMC		
Project Location:	Panama City, Florida		
Test Depth:	0.5 ft		
Depth to GWT:	1.6 ft		
Inner Ring Diameter:	12 in	0.3048 m	
Outer Ring Diameter:	24 in	0.6096 m	
Pre-Saturation	30 min		
Area Outer Ring:	3.1416 ft^2	0.00202683 m^2	
Area Inner Ring:	0.7854 ft^2	0.00050671 m^2	
Net Outer Ring Area:	2.3562 ft^2	0.00152013 m^2	

	Inner Ring		
Cycle	ElapTime (sec)	Vol Used (in^3)	Infiltration Rate (ft/sec)
1	300	207	5.08E-04
2	300	207	5.08E-04
3	300	200	4.91E-04
4	300	200	4.91E-04
5	300	200	4.91E-04
6	300	195	4.79E-04
7	300	195	4.79E-04
8	300	195	4.79E-04
9	300	195	4.79E-04
10	300	195	4.79E-04
11	300	195	4.79E-04
12	300	195	4.79E-04
13	300	195	4.79E-04
14	300	195	4.79E-04
15	300	195	4.79E-04
16	300	195	4.79E-04
17	300	195	4.79E-04
18	300	195	4.79E-04
Results	Sustained Rate	197	4.84E-04



Infiltration Rate: **1.46E-02 cm/sec** **20.7 in/hr**

DOCUMENT 004113 - BID FORM - STIPULATED SUM (SINGLE-PRIME CONTRACT)

PART 1 - GENERAL

1.1 BID INFORMATION

A. Bidder: _____.

B. Project Name: Church Building Renovation & Addition.

C. Project Location: 4400 W. 19th Street, Panama City, FL.

D. Owner: Trinity United Methodist Church.

E. Architect: Jennifer P. Jones, Architect, LLC.

F. Architect Project Number: 24002.

1.2 CERTIFICATIONS AND BASE BID

A. Base Bid, Single-Prime (All Trades) Contract: The undersigned Bidder, having carefully examined the Procurement and Contracting Requirements, Conditions of the Contract, Drawings, Specifications, and all subsequent Addenda, as prepared by Jennifer P. Jones, Architect, LLC and Architect's consultants, having visited the site, and being familiar with all conditions and requirements of the Work, hereby agrees to furnish all material, labor, equipment and services , including all scheduled allowances indicated in Section 012100 "Allowances, necessary to complete the construction of the above-named Project, in accordance with the requirements of the Procurement and Contracting Documents, for the stipulated sum of:

1. _____ Dollars ($_____).
2. The above amount may be modified by amounts indicated by the Bidder under the "Alternates" Article below.

1.3 ALTERNATES

A. The undersigned Bidder proposes the amount below be added to or deducted from the Base Bid if particular Alternates are accepted by Owner. Amounts listed for each Alternate include costs of related coordination, modification, or adjustment.

B. If the Alternate does not affect the Contract Sum, the Bidder to indicate "NO CHANGE."

C. If the Alternate does not affect the Work of this Contract, the Bidder to indicate "NOT APPLICABLE."

D. The Bidder is responsible for determining from the Contract Documents the effects of each Alternate on the Contract Time and the Contract Sum.

E. Acceptance or non-acceptance of any Alternates by Owner is to have no effect on the Contract Time unless the Alternate description below provides a formatted space for the adjustment of the Contract Time.

F. Alternate No. 1: Allowances for Decorative Chandeliers and Pendant Light Fixtures:

1. ___ ADD ___ DEDUCT ___ NO CHANGE ___ NOT APPLICABLE.
2. _____ Dollars ($_____).

G. Alternate No. 2: Faux Beams at lower vaulted ceiling of Living and Dining Rooms

1. ___ ADD ___ DEDUCT ___ NO CHANGE ___ NOT APPLICABLE.
2. _____Dollars ($_____).

H. Alternate No. 3: Tongue & Groove Wood Ceiling at Kitchen.

1. ___ ADD ___ DEDUCT ___NO CHANGE ___ NOT APPLICABLE.
2. _____ Dollars ($_____).

I. Alternate No. 4: Tongue & Groove Wood Ceiling at Chapel / Meeting Room.

1. ___ ADD ___ DEDUCT ___ NO CHANGE ___ NOT APPLICABLE.
2. _____ Dollars ($_____).

J. Alternate No. 5: Stamped and Stained Concrete at Patio.

1. ___ ADD ___ DEDUCT ___ NO CHANGE ___ NOT APPLICABLE.
2. _____ Dollars ($_____).

K. Alternate No. 6: Enclosure for future Outdoor Kitchen.

1. ___ ADD ___ DEDUCT ___ NO CHANGE ___ NOT APPLICABLE.
2. _____ Dollars ($_____).

L. Alternate No. 7: Prayer Garden

1. ___ ADD ___ DEDUCT ___ NO CHANGE ___ NOT APPLICABLE.
2. _____ Dollars ($_____).

M. Alternate No. 8: Upgraded Generator Inlet Box with camlock connectors

1. ___ ADD ___ DEDUCT ___ NO CHANGE ___ NOT APPLICABLE.
2. _____ Dollars ($_____).

N. Alternate No. 9: Generator

1. ___ ADD ___ DEDUCT ___ NO CHANGE ___ NOT APPLICABLE.
2. _____ Dollars ($_____).

1.4 BID SECURITY

A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 60 days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached Bid Security, as liquidated damages for such failure as follows:

1. In the following amount constituting 5 percent (5%) of the Base Bid amount above:

a. _____ Dollars ($_____).

B. Form of Bid Security: Bidder has attached the following:

1. ___ AIA Document A310-2010, "Bid Bond."

C. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cashier's check, certified check, or bid bond.

1.5 TIME OF COMPLETION

A. Time of Completion:

1. The undersigned Bidder proposes and agrees hereby to commence the Work of the Contract Documents on a date specified in a written Notice to Proceed to be issued by Architect, and to substantially complete the Work within 210 calendar days.

1.6 ACKNOWLEDGMENT OF ADDENDA

A. The undersigned Bidder acknowledges receipt of and use of the following Addenda in the preparation of this Bid:

1. Addendum No. 1, dated _____.
2. Addendum No. 2, dated _____.
3. Addendum No. 3, dated _____.

4. Addendum No. 4, dated _____.
5. Addendum No. 5, dated _____.

1.7 BID SUPPLEMENTS

A. The following supplements are a part of this Bid Form and are attached hereto:

1. Bid Form Supplement - Bid Bond Form (AIA Document A310).
2. Certification Regarding Lobbying.
3. Certification Regarding Debarment, Suspension, Ineligibility, and Voluntary Exclusion.

1.8 CONTRACTOR'S LICENSE

A. The undersigned further states that it is a duly licensed contractor, for the type of work proposed, in the City of Panama City, Florida, and that all fees, permits, etc., pursuant to submitting this proposal have been paid in full.

1.9 SUBMISSION OF BID

A. Respectfully submitted this ____ day of _____ 2026.

B. Submitted by: _____ (Name of bidding firm or corporation).

C. Authorized Signature: _____ (Handwritten signature).

D. Signed by: _____ (Type or print name).

E. Title: _____ (Owner/Partner/President/Vice President).

F. Witnessed by: _____ (Handwritten signature).

G. Attest: _____ (Handwritten signature).

H. By: _____ (Type or print name).

I. Attester Title: _____ (Corporate Secretary or Assistant Secretary).

J. Street Address: _____.

K. City, State, Zip: _____.

L. Phone: _____.

M. License No.: _____.

N. Federal ID No.: _____.

O. (Affix Corporate Seal Here)

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF DOCUMENT 004113

DOCUMENT 004373 - PROPOSED SCHEDULE OF VALUES FORM

PART 1 - GENERAL

1.1 BID FORM SUPPLEMENT

A. A completed Proposed Schedule of Values form is required to be emailed to the Architect within 24 hours after the receipt of bids.

1.2 PROPOSED SCHEDULE OF VALUES FORM

A. Proposed Schedule of Values Form: Provide a breakdown of the bid amount, including Alternates, in enough detail to facilitate continued evaluation of bid. Organize and label contents by section in accordance with the Project Manual table of contents.

1. Provide multiple line items for principal material and subcontract amounts in excess of five percent of the Contract Sum.

B. Arrange Schedule of Values using AIA Document G703-1992.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF DOCUMENT 004373

DOCUMENT 004393 - BID SUBMITTAL CHECKLIST

PART 1 - GENERAL

1.1 BID INFORMATION

A. Project Name: Church Renovation and Addition.

B. Bidder: _____.

C. Owner: Trinity United Methodist Church.

1.2 BIDDER'S CHECKLIST

A. To assist the Bidder in properly completing all documentation required, the following checklist is provided for the Bidder's convenience. The Bidder is solely responsible for verifying compliance with bid submittal requirements. Bids and Bid Supplements shall be submitted as paper copies.

B. Attach this completed checklist to the Bid Form.

1. __ Used the Bid Form provided in the Project Manual.
2. __ Prepared the Bid Form as required by the Instructions to Bidders.
3. __ Indicated on the Bid Form the Addenda received.
4. __ Indicated on the Bid Form cost associated with listed Alternates.
5. __ Attached to the Bid Form Bid Security in form and for the amount required.
6. __ Attached to the Bid Form Bid Bond Form (AIA Document A310).
7. __ Attached to the Bid Form the Certification Regarding Lobbying (found at Section 007400 Special Conditions, Appendix A)
8. __ Attached to the Bid Form Certification Regarding Debarment, Suspension, Ineligibility, and Voluntary Exclusion (found at Section 007400 Special Conditions, Appendix B)
9. __ Verified that the Bidder can provide executed Performance Bond and Payment Bond as described in the Bidding Documents.
10. __ Verified that the Bidder can provide Certificates of Insurance in the amounts indicated in the Bidding Documents.
11. __ Bid envelope shows name and address of the Bidder.
12. __ Bid envelope shows the Bidder's Contractor's License Number.
13. __ Bid envelope shows the Bidder’s Unique Entity ID (as obtained at SAM.gov)
14. __ Bid envelope shows name of Project being bid.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF DOCUMENT 004393

DOCUMENT 006000 - PROJECT FORMS

PART 1 - GENERAL

1.1 FORM OF AGREEMENT AND GENERAL CONDITIONS

A. The following form of Owner/Contractor Agreement and form of the General Conditions to be used for Project:

1. AIA Document A101-2017 "Standard Form of Agreement between Owner and Contractor Where the Basis of Payment is a Stipulated Sum."

a. The General Conditions for Project are AIA Document A201-2017 "General Conditions of the Contract for Construction."

2. The General Conditions are included in the Project Manual.
3. The Supplementary Conditions for Project are separately prepared and included in the Project Manual.

1.2 ADMINISTRATIVE FORMS

A. Administrative Forms: Additional administrative forms are specified in Division 01 General Requirements.

B. Copies of AIA standard forms may be obtained from AIA Contract Documents: https://aiacontracts.com.

C. Preconstruction Forms:

1. Form of Performance Bond and Labor and Material Bond: AIA Document A312-2010 "Performance Bond" and AIA Document A312-2010 "Payment Bond."
2. Form of Certificate of Insurance: AIA Document G715-2017 "Supplemental Attachment for ACORD Certificate of Insurance 25."

D. Information and Modification Forms:

1. Form for Requests for Information (RFIs): AIA Document G716-2004 "Request for Information (RFI)."
2. Form of Request for Proposal: AIA Document G709-2018 "Proposal Request."
3. Change Order Form: AIA Document G701-2017 "Change Order."

E. Payment Forms:

1. Schedule of Values Form: AIA Document G703-1992 "Continuation Sheet."
2. Payment Application, Lump Sum Project: AIA Document G702-1992 "Application and Certificate for Payment" and G703-1992 "Continuation Sheet."

3. Form of Contractor's Affidavit: AIA Document G706-1994 "Contractor's Affidavit of Payment of Debts and Claims".
4. Form of Affidavit of Release of Liens on Progress Payments: AIA Document G901-2022 "Conditional Waiver and Release on Progress Payment" and AIA Document G902FL-2022, "Florida Waiver and Release of Lien Upon Progress Payment.".
5. Form of Affidavit of Release of Liens on Final Payments: AIA Document G903-2022 "Conditional Waiver and Release on Final Payment" AIA Document G904FL-2022 "Florida Waiver and Release of Lien Upon Final Payment".
6. Form of Consent of Surety: AIA Document G707-1994 "Consent of Surety to Final Payment."

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF DOCUMENT 006000

DRAFT AIA® Document A101® – 2017

Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum

AGREEMENT made as of the « » day of « » in the year « »
(In words, indicate day, month and year.)

BETWEEN the Owner:
(Name, legal status, address and other information)

« »« »
« »
« »
« »

and the Contractor:
(Name, legal status, address and other information)

« »« »
« »
« »
« »

for the following Project:
(Name, location and detailed description)

« »
« »
« »

The Architect:
(Name, legal status, address and other information)

« »« »
« »
« »
« »

The Owner and Contractor agree as follows.

ADDITIONS AND DELETIONS: The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

The parties should complete A101®–2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement. AIA Document A201®–2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.



ELECTRONIC COPYING of any portion of this AIA® Document to another electronic file is prohibited and constitutes a violation of copyright laws as set forth in the footer of this document.

AIA Document A101 – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This draft was produced at 16:36:01 ET on 01/23/2026 under Order No.500026793_1 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1450654067)

TABLE OF ARTICLES

1 THE CONTRACT DOCUMENTS

2 THE WORK OF THIS CONTRACT

3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

4 CONTRACT SUM

5 PAYMENTS

6 DISPUTE RESOLUTION

7 TERMINATION OR SUSPENSION

8 MISCELLANEOUS PROVISIONS

9 ENUMERATION OF CONTRACT DOCUMENTS

EXHIBIT A INSURANCE AND BONDS

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:
(Check one of the following boxes.)

[« »] The date of this Agreement.

[« »] A date set forth in a notice to proceed issued by the Owner.

[« »] Established as follows:
(Insert a date or a means to determine the date of commencement of the Work.)

« »

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

§ 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:
(Check one of the following boxes and complete the necessary information.)

AIA Document A101 – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This draft was produced at 16:36:01 ET on 01/23/2026 under Order No.500026793_1 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1450654067)

[« »] Not later than « » (« ») calendar days from the date of commencement of the Work.

[« »] By the following date: « »

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work are to be completed prior to Substantial Completion of the entire Work, the Contractor shall achieve Substantial Completion of such portions by the following dates:

Portion of Work	Substantial Completion Date

§ 3.3.3 If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be « » ($ « »), subject to additions and deductions as provided in the Contract Documents.

§ 4.2 Alternates

§ 4.2.1 Alternates, if any, included in the Contract Sum:

Item	Price

§ 4.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement.
(Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)

Item	Price	Conditions for Acceptance

§ 4.3 Allowances, if any, included in the Contract Sum:
(Identify each allowance.)

Item	Price

§ 4.4 Unit prices, if any:
(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price per Unit ($0.00)

§ 4.5 Liquidated damages, if any:
(Insert terms and conditions for liquidated damages, if any.)

« »

§ 4.6 Other:
(Insert provisions for bonus or other incentives, if any, that might result in a change to the Contract Sum.)

« »

AIA Document A101 – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This draft was produced at 16:36:01 ET on 01/23/2026 under Order No.500026793_1 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1450654067)

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

« »

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the « » day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the « » day of the « » month. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than « » (« ») days after the Architect receives the Application for Payment.
(Federal, state or local laws may require payment within a certain period of time.)

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.6 In accordance with AIA Document A201™–2017, General Conditions of the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.6.1 The amount of each progress payment shall first include:

- **.1** That portion of the Contract Sum properly allocable to completed Work;
- **.2** That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and
- **.3** That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

§ 5.1.6.2 The amount of each progress payment shall then be reduced by:

- **.1** The aggregate of any amounts previously paid by the Owner;
- **.2** The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201–2017;
- **.3** Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;
- **.4** For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201–2017; and
- **.5** Retainage withheld pursuant to Section 5.1.7.

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due:
(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

« »

AIA Document A101 – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This draft was produced at 16:36:01 ET on 01/23/2026 under Order No.500026793_1 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1450654067)

§ 5.1.7.1.1 The following items are not subject to retainage:
(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)

« »

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:
(If the retainage established in Section 5.1.7.1 is to be modified prior to Substantial Completion of the entire Work, including modifications for Substantial Completion of portions of the Work as provided in Section 3.3.2, insert provisions for such modifications.)

« »

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted at Substantial Completion shall not include retainage as follows:
(Insert any other conditions for release of retainage upon Substantial Completion.)

« »

§ 5.1.8 If final completion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A201–2017.

§ 5.1.9 Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.2 Final Payment

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

.1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A201–2017, and to satisfy other requirements, if any, which extend beyond final payment; and

.2 a final Certificate for Payment has been issued by the Architect.

§ 5.2.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the Architect's final Certificate for Payment, or as follows:

« »

§ 5.3 Interest

Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.
(Insert rate of interest agreed upon, if any.)

« » % « »

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017, unless the parties appoint below another individual, not a party to this Agreement, to serve as the Initial Decision Maker.
(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

« »
« »
« »

AIA Document A101 – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This draft was produced at 16:36:01 ET on 01/23/2026 under Order No.500026793_1 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1450654067)

« »

§ 6.2 Binding Dispute Resolution

For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A201–2017, the method of binding dispute resolution shall be as follows:
(Check the appropriate box.)

[« »] Arbitration pursuant to Section 15.4 of AIA Document A201–2017

[« »] Litigation in a court of competent jurisdiction

[« »] Other *(Specify)*

« »

If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2017.

§ 7.1.1 If the Contract is terminated for the Owner's convenience in accordance with Article 14 of AIA Document A201–2017, then the Owner shall pay the Contractor a termination fee as follows:
(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner's convenience.)

« »

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2017.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2017 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner's representative:
(Name, address, email address, and other information)

« »
« »
« »
« »
« »
« »

§ 8.3 The Contractor's representative:
(Name, address, email address, and other information)

« »
« »
« »
« »
« »
« »

AIA Document A101 – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This draft was produced at 16:36:01 ET on 01/23/2026 under Order No.500026793_1 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1450654067)

§ 8.4 Neither the Owner's nor the Contractor's representative shall be changed without ten days' prior notice to the other party.

§ 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, Exhibit A, Insurance and Bonds, and elsewhere in the Contract Documents.

§ 8.5.2 The Contractor shall provide bonds as set forth in AIA Document A101™–2017 Exhibit A, and elsewhere in the Contract Documents.

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A201–2017, may be given in accordance with a building information modeling exhibit, if completed, or as otherwise set forth below:
(If other than in accordance with a building information modeling exhibit, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)

« »

§ 8.7 Other provisions:

« »

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

.1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor

.2 AIA Document A101™–2017, Exhibit A, Insurance and Bonds

.3 AIA Document A201™–2017, General Conditions of the Contract for Construction

.4 Building information modeling exhibit, dated as indicated below:
(Insert the date of the building information modeling exhibit incorporated into this Agreement.)

« »

.5 Drawings

Number	Title	Date

.6 Specifications

Section	Title	Date	Pages

.7 Addenda, if any:

Number	Date	Pages

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

.8 Other Exhibits:
(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

[« »] AIA Document E204™–2017, Sustainable Projects Exhibit, dated as indicated below:
(Insert the date of the E204-2017 incorporated into this Agreement.)

AIA Document A101 – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This draft was produced at 16:36:01 ET on 01/23/2026 under Order No.500026793_1 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1450654067)

« »

[« »] The Sustainability Plan:

Title	Date	Pages

[« »] Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages

.9 Other documents, if any, listed below:
(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201™–2017 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)

« »

This Agreement entered into as of the day and year first written above.

OWNER *(Signature)*	**CONTRACTOR** *(Signature)*
« »« »	« »« »
(Printed name and title)	*(Printed name and title)*

AIA Document A101 – 2017. Copyright © 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1967, 1974, 1977, 1987, 1991, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This draft was produced at 16:36:01 ET on 01/23/2026 under Order No.500026793_1 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1450654067)

DRAFT AIA® Document A101® – 2017 Exhibit A

Insurance and Bonds

This Insurance and Bonds Exhibit is part of the Agreement, between the Owner and the Contractor, dated the « » day of « » in the year « »
(In words, indicate day, month and year.)

for the following **PROJECT**:
(Name and location or address)

« »
« »

THE OWNER:
(Name, legal status and address)

« »« »
« »

THE CONTRACTOR:
(Name, legal status and address)

« »« »
« »

TABLE OF ARTICLES

A.1 GENERAL

A.2 OWNER'S INSURANCE

A.3 CONTRACTOR'S INSURANCE AND BONDS

A.4 SPECIAL TERMS AND CONDITIONS

ARTICLE A.1 GENERAL

The Owner and Contractor shall purchase and maintain insurance, and provide bonds, as set forth in this Exhibit. As used in this Exhibit, the term General Conditions refers to AIA Document A201™–2017, General Conditions of the Contract for Construction.

ARTICLE A.2 OWNER'S INSURANCE

§ A.2.1 General

Prior to commencement of the Work, the Owner shall secure the insurance, and provide evidence of the coverage, required under this Article A.2 and, upon the Contractor's request, provide a copy of the property insurance policy or policies required by Section A.2.3. The copy of the policy or policies provided shall contain all applicable conditions, definitions, exclusions, and endorsements.

§ A.2.2 Liability Insurance

The Owner shall be responsible for purchasing and maintaining the Owner's usual general liability insurance.

§ A.2.3 Required Property Insurance

ADDITIONS AND DELETIONS: The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

This document is intended to be used in conjunction with AIA Document A201®–2017, General Conditions of the Contract for Construction. Article 11 of A201®–2017 contains additional insurance provisions.

ELECTRONIC COPYING of any portion of this AIA® Document to another electronic file is prohibited and constitutes a violation of copyright laws as set forth in the footer of this document.

AIA Document A101 – 2017 Exhibit A. Copyright © 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This draft was produced at 17:07:50 ET on 01/23/2026 under Order No.500026793_1 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1399019638)

§ A.2.3.1 Unless this obligation is placed on the Contractor pursuant to Section A.3.3.2.1, the Owner shall purchase and maintain, from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located, property insurance written on a builder's risk "all-risks" completed value or equivalent policy form and sufficient to cover the total value of the entire Project on a replacement cost basis. The Owner's property insurance coverage shall be no less than the amount of the initial Contract Sum, plus the value of subsequent Modifications and labor performed and materials or equipment supplied by others. The property insurance shall be maintained until Substantial Completion and thereafter as provided in Section A.2.3.1.3, unless otherwise provided in the Contract Documents or otherwise agreed in writing by the parties to this Agreement. This insurance shall include the interests of the Owner, Contractor, Subcontractors, and Sub-subcontractors in the Project as insureds. This insurance shall include the interests of mortgagees as loss payees.

§ A.2.3.1.1 Causes of Loss. The insurance required by this Section A.2.3.1 shall provide coverage for direct physical loss or damage, and shall not exclude the risks of fire, explosion, theft, vandalism, malicious mischief, collapse, earthquake, flood, or windstorm. The insurance shall also provide coverage for ensuing loss or resulting damage from error, omission, or deficiency in construction methods, design, specifications, workmanship, or materials. Sub-limits, if any, are as follows:
(Indicate below the cause of loss and any applicable sub-limit.)

Causes of Loss	Sub-Limit

§ A.2.3.1.2 Specific Required Coverages. The insurance required by this Section A.2.3.1 shall provide coverage for loss or damage to falsework and other temporary structures, and to building systems from testing and startup. The insurance shall also cover debris removal, including demolition occasioned by enforcement of any applicable legal requirements, and reasonable compensation for the Architect's and Contractor's services and expenses required as a result of such insured loss, including claim preparation expenses. Sub-limits, if any, are as follows:
(Indicate below type of coverage and any applicable sub-limit for specific required coverages.)

Coverage	Sub-Limit

§ A.2.3.1.3 Unless the parties agree otherwise, upon Substantial Completion, the Owner shall continue the insurance required by Section A.2.3.1 or, if necessary, replace the insurance policy required under Section A.2.3.1 with property insurance written for the total value of the Project that shall remain in effect until expiration of the period for correction of the Work set forth in Section 12.2.2 of the General Conditions.

§ A.2.3.1.4 Deductibles and Self-Insured Retentions. If the insurance required by this Section A.2.3 is subject to deductibles or self-insured retentions, the Owner shall be responsible for all loss not covered because of such deductibles or retentions.

§ A.2.3.2 Occupancy or Use Prior to Substantial Completion. The Owner's occupancy or use of any completed or partially completed portion of the Work prior to Substantial Completion shall not commence until the insurance company or companies providing the insurance under Section A.2.3.1 have consented in writing to the continuance of coverage. The Owner and the Contractor shall take no action with respect to partial occupancy or use that would cause cancellation, lapse, or reduction of insurance, unless they agree otherwise in writing.

§ A.2.3.3 Insurance for Existing Structures
If the Work involves remodeling an existing structure or constructing an addition to an existing structure, the Owner shall purchase and maintain, until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, "all-risks" property insurance, on a replacement cost basis, protecting the existing structure against direct physical loss or damage from the causes of loss identified in Section A.2.3.1, notwithstanding the undertaking of the Work. The Owner shall be responsible for all co-insurance penalties.

§ A.2.4 Optional Extended Property Insurance.
The Owner shall purchase and maintain the insurance selected and described below.

AIA Document A101 – 2017 Exhibit A. Copyright © 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This draft was produced at 17:07:50 ET on 01/23/2026 under Order No.500026793_1 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1399019638)

(Select the types of insurance the Owner is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. For each type of insurance selected, indicate applicable limits of coverage or other conditions in the fill point below the selected item.)

[« »] **§ A.2.4.1 Loss of Use, Business Interruption, and Delay in Completion Insurance**, to reimburse the Owner for loss of use of the Owner's property, or the inability to conduct normal operations due to a covered cause of loss.

« »

[« »] **§ A.2.4.2 Ordinance or Law Insurance**, for the reasonable and necessary costs to satisfy the minimum requirements of the enforcement of any law or ordinance regulating the demolition, construction, repair, replacement or use of the Project.

« »

[« »] **§ A.2.4.3 Expediting Cost Insurance**, for the reasonable and necessary costs for the temporary repair of damage to insured property, and to expedite the permanent repair or replacement of the damaged property.

« »

[« »] **§ A.2.4.4 Extra Expense Insurance**, to provide reimbursement of the reasonable and necessary excess costs incurred during the period of restoration or repair of the damaged property that are over and above the total costs that would normally have been incurred during the same period of time had no loss or damage occurred.

« »

[« »] **§ A.2.4.5 Civil Authority Insurance**, for losses or costs arising from an order of a civil authority prohibiting access to the Project, provided such order is the direct result of physical damage covered under the required property insurance.

« »

[« »] **§ A.2.4.6 Ingress/Egress Insurance**, for loss due to the necessary interruption of the insured's business due to physical prevention of ingress to, or egress from, the Project as a direct result of physical damage.

« »

[« »] **§ A.2.4.7 Soft Costs Insurance**, to reimburse the Owner for costs due to the delay of completion of the Work, arising out of physical loss or damage covered by the required property insurance: including construction loan fees; leasing and marketing expenses; additional fees, including those of architects, engineers, consultants, attorneys and accountants, needed for the completion of the construction, repairs, or reconstruction; and carrying costs such as property taxes, building permits, additional interest on loans, realty taxes, and insurance premiums over and above normal expenses.

« »

§ A.2.5 Other Optional Insurance.

The Owner shall purchase and maintain the insurance selected below.

(Select the types of insurance the Owner is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance.)

AIA Document A101 – 2017 Exhibit A. Copyright © 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This draft was produced at 17:07:50 ET on 01/23/2026 under Order No.500026793_1 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1399019638)

[« »] **§ A.2.5.1 Cyber Security Insurance** for loss to the Owner due to data security and privacy breach, including costs of investigating a potential or actual breach of confidential or private information. *(Indicate applicable limits of coverage or other conditions in the fill point below.)*

« »

[« »] **§ A.2.5.2 Other Insurance**
(List below any other insurance coverage to be provided by the Owner and any applicable limits.)

Coverage	Limits

ARTICLE A.3 CONTRACTOR'S INSURANCE AND BONDS

§ A.3.1 General

§ A.3.1.1 Certificates of Insurance. The Contractor shall provide certificates of insurance acceptable to the Owner evidencing compliance with the requirements in this Article A.3 at the following times: (1) prior to commencement of the Work; (2) upon renewal or replacement of each required policy of insurance; and (3) upon the Owner's written request. An additional certificate evidencing continuation of commercial liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment and thereafter upon renewal or replacement of such coverage until the expiration of the periods required by Section A.3.2.1 and Section A.3.3.1. The certificates will show the Owner as an additional insured on the Contractor's Commercial General Liability and excess or umbrella liability policy or policies.

§ A.3.1.2 Deductibles and Self-Insured Retentions. The Contractor shall disclose to the Owner any deductible or self-insured retentions applicable to any insurance required to be provided by the Contractor.

§ A.3.1.3 Additional Insured Obligations. To the fullest extent permitted by law, the Contractor shall cause the commercial general liability coverage to include (1) the Owner, the Architect, and the Architect's consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions for which loss occurs during completed operations. The additional insured coverage shall be primary and non-contributory to any of the Owner's general liability insurance policies and shall apply to both ongoing and completed operations. To the extent commercially available, the additional insured coverage shall be no less than that provided by Insurance Services Office, Inc. (ISO) forms CG 20 10 07 04, CG 20 37 07 04, and, with respect to the Architect and the Architect's consultants, CG 20 32 07 04.

§ A.3.2 Contractor's Required Insurance Coverage

§ A.3.2.1 The Contractor shall purchase and maintain the following types and limits of insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:
(If the Contractor is required to maintain insurance for a duration other than the expiration of the period for correction of Work, state the duration.)

« »

§ A.3.2.2 Commercial General Liability

§ A.3.2.2.1 Commercial General Liability insurance for the Project written on an occurrence form with policy limits of not less than « » ($ « ») each occurrence, « » ($ « ») general aggregate, and « » ($ « ») aggregate for products-completed operations hazard, providing coverage for claims including

.1 damages because of bodily injury, sickness or disease, including occupational sickness or disease, and death of any person;

.2 personal injury and advertising injury;

.3 damages because of physical damage to or destruction of tangible property, including the loss of use of such property;

.4 bodily injury or property damage arising out of completed operations; and

AIA Document A101 – 2017 Exhibit A. Copyright © 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This draft was produced at 17:07:50 ET on 01/23/2026 under Order No.500026793_1 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1399019638)

.5 the Contractor's indemnity obligations under Section 3.18 of the General Conditions.

§ A.3.2.2.2 The Contractor's Commercial General Liability policy under this Section A.3.2.2 shall not contain an exclusion or restriction of coverage for the following:

.1 Claims by one insured against another insured, if the exclusion or restriction is based solely on the fact that the claimant is an insured, and there would otherwise be coverage for the claim.

.2 Claims for property damage to the Contractor's Work arising out of the products-completed operations hazard where the damaged Work or the Work out of which the damage arises was performed by a Subcontractor.

.3 Claims for bodily injury other than to employees of the insured.

.4 Claims for indemnity under Section 3.18 of the General Conditions arising out of injury to employees of the insured.

.5 Claims or loss excluded under a prior work endorsement or other similar exclusionary language.

.6 Claims or loss due to physical damage under a prior injury endorsement or similar exclusionary language.

.7 Claims related to residential, multi-family, or other habitational projects, if the Work is to be performed on such a project.

.8 Claims related to roofing, if the Work involves roofing.

.9 Claims related to exterior insulation finish systems (EIFS), synthetic stucco or similar exterior coatings or surfaces, if the Work involves such coatings or surfaces.

.10 Claims related to earth subsidence or movement, where the Work involves such hazards.

.11 Claims related to explosion, collapse and underground hazards, where the Work involves such hazards.

§ A.3.2.3 Automobile Liability covering vehicles owned, and non-owned vehicles used, by the Contractor, with policy limits of not less than « » ($ « ») per accident, for bodily injury, death of any person, and property damage arising out of the ownership, maintenance and use of those motor vehicles along with any other statutorily required automobile coverage.

§ A.3.2.4 The Contractor may achieve the required limits and coverage for Commercial General Liability and Automobile Liability through a combination of primary and excess or umbrella liability insurance, provided such primary and excess or umbrella insurance policies result in the same or greater coverage as the coverages required under Section A.3.2.2 and A.3.2.3, and in no event shall any excess or umbrella liability insurance provide narrower coverage than the primary policy. The excess policy shall not require the exhaustion of the underlying limits only through the actual payment by the underlying insurers.

§ A.3.2.5 Workers' Compensation at statutory limits.

§ A.3.2.6 Employers' Liability with policy limits not less than « » ($ « ») each accident, « » ($ « ») each employee, and « » ($ « ») policy limit.

§ A.3.2.7 Jones Act, and the Longshore & Harbor Workers' Compensation Act, as required, if the Work involves hazards arising from work on or near navigable waterways, including vessels and docks

§ A.3.2.8 If the Contractor is required to furnish professional services as part of the Work, the Contractor shall procure Professional Liability insurance covering performance of the professional services, with policy limits of not less than « » ($ « ») per claim and « » ($ « ») in the aggregate.

§ A.3.2.9 If the Work involves the transport, dissemination, use, or release of pollutants, the Contractor shall procure Pollution Liability insurance, with policy limits of not less than « » ($ « ») per claim and « » ($ « ») in the aggregate.

§ A.3.2.10 Coverage under Sections A.3.2.8 and A.3.2.9 may be procured through a Combined Professional Liability and Pollution Liability insurance policy, with combined policy limits of not less than « » ($ « ») per claim and « » ($ « ») in the aggregate.

§ A.3.2.11 Insurance for maritime liability risks associated with the operation of a vessel, if the Work requires such activities, with policy limits of not less than « » ($ « ») per claim and « » ($ « ») in the aggregate.

AIA Document A101 – 2017 Exhibit A. Copyright © 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This draft was produced at 17:07:50 ET on 01/23/2026 under Order No.500026793_1 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1399019638)

§ A.3.2.12 Insurance for the use or operation of manned or unmanned aircraft, if the Work requires such activities, with policy limits of not less than « » ($ « ») per claim and « » ($ « ») in the aggregate.

§ A.3.3 Contractor's Other Insurance Coverage

§ A.3.3.1 Insurance selected and described in this Section A.3.3 shall be purchased from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:

(If the Contractor is required to maintain any of the types of insurance selected below for a duration other than the expiration of the period for correction of Work, state the duration.)

« »

§ A.3.3.2 The Contractor shall purchase and maintain the following types and limits of insurance in accordance with Section A.3.3.1.

(Select the types of insurance the Contractor is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. Where policy limits are provided, include the policy limit in the appropriate fill point.)

[« »] **§ A.3.3.2.1** Property insurance of the same type and scope satisfying the requirements identified in Section A.2.3, which, if selected in this section A.3.3.2.1, relieves the Owner of the responsibility to purchase and maintain such insurance except insurance required by Section A.2.3.1.3 and Section A.2.3.3. The Contractor shall comply with all obligations of the Owner under Section A.2.3 except to the extent provided below. The Contractor shall disclose to the Owner the amount of any deductible, and the Owner shall be responsible for losses within the deductible. Upon request, the Contractor shall provide the Owner with a copy of the property insurance policy or policies required. The Owner shall adjust and settle the loss with the insurer and be the trustee of the proceeds of the property insurance in accordance with Article 11 of the General Conditions unless otherwise set forth below:

(Where the Contractor's obligation to provide property insurance differs from the Owner's obligations as described under Section A.2.3, indicate such differences in the space below. Additionally, if a party other than the Owner will be responsible for adjusting and settling a loss with the insurer and acting as the trustee of the proceeds of property insurance in accordance with Article 11 of the General Conditions, indicate the responsible party below.)

« »

[« »] **§ A.3.3.2.2 Railroad Protective Liability Insurance**, with policy limits of not less than « » ($ « ») per claim and « » ($ « ») in the aggregate, for Work within fifty (50) feet of railroad property.

[« »] **§ A.3.3.2.3 Asbestos Abatement Liability Insurance**, with policy limits of not less than « » ($ « ») per claim and « » ($ « ») in the aggregate, for liability arising from the encapsulation, removal, handling, storage, transportation, and disposal of asbestos-containing materials.

[« »] **§ A.3.3.2.4** Insurance for physical damage to property while it is in storage and in transit to the construction site on an "all-risks" completed value form.

[« »] **§ A.3.3.2.5** Property insurance on an "all-risks" completed value form, covering property owned by the Contractor and used on the Project, including scaffolding and other equipment.

[« »] **§ A.3.3.2.6 Other Insurance**

(List below any other insurance coverage to be provided by the Contractor and any applicable limits.)

Coverage	Limits

AIA Document A101 – 2017 Exhibit A. Copyright © 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This draft was produced at 17:07:50 ET on 01/23/2026 under Order No.500026793_1 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1399019638)

§ A.3.4 Performance Bond and Payment Bond

The Contractor shall provide surety bonds, from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located, as follows:
(Specify type and penal sum of bonds.)

Type	Penal Sum ($0.00)
Payment Bond	
Performance Bond	

Payment and Performance Bonds shall be AIA Document A312™, Payment Bond and Performance Bond, or contain provisions identical to AIA Document A312™, current as of the date of this Agreement.

ARTICLE A.4 SPECIAL TERMS AND CONDITIONS

Special terms and conditions that modify this Insurance and Bonds Exhibit, if any, are as follows:

« »

AIA Document A101 – 2017 Exhibit A. Copyright © 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This draft was produced at 17:07:50 ET on 01/23/2026 under Order No.500026793_1 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1399019638)

AIA® Document A201® – 2017

General Conditions of the Contract for Construction

for the following PROJECT:
(Name and location or address)

Church Building Renovation & Addition
4400 W. 19th Street, Panama City, Florida, 32405

THE OWNER:
(Name, legal status and address)

Trinity United Methodist Church, Inc. Incorporated
4400 W. 19th Street, Panama City, Florida, 32405

THE ARCHITECT:
(Name, legal status and address)

Jennifer P. Jones, Architect, LLC Limited Liability Company
7901 4th St. N., Suite 300, St. Petersburg, FL 33702

TABLE OF ARTICLES

1 GENERAL PROVISIONS
2 OWNER
3 CONTRACTOR
4 ARCHITECT
5 SUBCONTRACTORS
6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS
7 CHANGES IN THE WORK
8 TIME
9 PAYMENTS AND COMPLETION
10 PROTECTION OF PERSONS AND PROPERTY
11 INSURANCE AND BONDS
12 UNCOVERING AND CORRECTION OF WORK
13 MISCELLANEOUS PROVISIONS
14 TERMINATION OR SUSPENSION OF THE CONTRACT
15 CLAIMS AND DISPUTES

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

For guidance in modifying this document to include supplementary conditions, see AIA Document A503™, Guide for Supplementary Conditions.

Init.
/

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

INDEX
(Topics and numbers in bold are Section headings.)

Acceptance of Nonconforming Work
9.6.6, 9.9.3, **12.3**
Acceptance of Work
9.6.6, 9.8.2, 9.9.3, 9.10.1, 9.10.3, 12.3
Access to Work
3.16, 6.2.1, 12.1
Accident Prevention
10
Acts and Omissions
3.2, 3.3.2, 3.12.8, 3.18, 4.2.3, 8.3.1, 9.5.1, 10.2.5, 10.2.8, 13.3.2, 14.1, 15.1.2, 15.2
Addenda
1.1.1
Additional Costs, Claims for
3.7.4, 3.7.5, 10.3.2, 15.1.5
Additional Inspections and Testing
9.4.2, 9.8.3, 12.2.1, **13.4**
Additional Time, Claims for
3.2.4, 3.7.4, 3.7.5, 3.10.2, 8.3.2, **15.1.6**
Administration of the Contract
3.1.3, **4.2**, 9.4, 9.5
Advertisement or Invitation to Bid
1.1.1
Aesthetic Effect
4.2.13
Allowances
3.8
Applications for Payment
4.2.5, 7.3.9, 9.2, **9.3**, 9.4, 9.5.1, 9.5.4, 9.6.3, 9.7, 9.10
Approvals
2.1.1, 2.3.1, 2.5, 3.1.3, 3.10.2, 3.12.8, 3.12.9, 3.12.10.1, 4.2.7, 9.3.2, 13.4.1
Arbitration
8.3.1, 15.3.2, **15.4**
ARCHITECT
4
Architect, Definition of
4.1.1
Architect, Extent of Authority
2.5, 3.12.7, 4.1.2, 4.2, 5.2, 6.3, 7.1.2, 7.3.4, 7.4, 9.2, 9.3.1, 9.4, 9.5, 9.6.3, 9.8, 9.10.1, 9.10.3, 12.1, 12.2.1, 13.4.1, 13.4.2, 14.2.2, 14.2.4, 15.1.4, 15.2.1
Architect, Limitations of Authority and Responsibility
2.1.1, 3.12.4, 3.12.8, 3.12.10, 4.1.2, 4.2.1, 4.2.2, 4.2.3, 4.2.6, 4.2.7, 4.2.10, 4.2.12, 4.2.13, 5.2.1, 7.4, 9.4.2, 9.5.4, 9.6.4, 15.1.4, 15.2
Architect's Additional Services and Expenses
2.5, 12.2.1, 13.4.2, 13.4.3, 14.2.4
Architect's Administration of the Contract
3.1.3, 3.7.4, 15.2, 9.4.1, 9.5
Architect's Approvals
2.5, 3.1.3, 3.5, 3.10.2, 4.2.7
Architect's Authority to Reject Work
3.5, 4.2.6, 12.1.2, 12.2.1
Architect's Copyright
1.1.7, 1.5
Architect's Decisions
3.7.4, 4.2.6, 4.2.7, 4.2.11, 4.2.12, 4.2.13, 4.2.14, 6.3, 7.3.4, 7.3.9, 8.1.3, 8.3.1, 9.2, 9.4.1, 9.5, 9.8.4, 9.9.1, 13.4.2, 15.2
Architect's Inspections
3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.8.3, 9.9.2, 9.10.1, 13.4
Architect's Instructions
3.2.4, 3.3.1, 4.2.6, 4.2.7, 13.4.2
Architect's Interpretations
4.2.11, 4.2.12
Architect's Project Representative
4.2.10
Architect's Relationship with Contractor
1.1.2, 1.5, 2.3.3, 3.1.3, 3.2.2, 3.2.3, 3.2.4, 3.3.1, 3.4.2, 3.5, 3.7.4, 3.7.5, 3.9.2, 3.9.3, 3.10, 3.11, 3.12, 3.16, 3.18, 4.1.2, 4.2, 5.2, 6.2.2, 7, 8.3.1, 9.2, 9.3, 9.4, 9.5, 9.7, 9.8, 9.9, 10.2.6, 10.3, 11.3, 12, 13.3.2, 13.4, 15.2
Architect's Relationship with Subcontractors
1.1.2, 4.2.3, 4.2.4, 4.2.6, 9.6.3, 9.6.4, 11.3
Architect's Representations
9.4.2, 9.5.1, 9.10.1
Architect's Site Visits
3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.5.1, 9.9.2, 9.10.1, 13.4
Asbestos
10.3.1
Attorneys' Fees
3.18.1, 9.6.8, 9.10.2, 10.3.3
Award of Separate Contracts
6.1.1, 6.1.2
Award of Subcontracts and Other Contracts for Portions of the Work
5.2
Basic Definitions
1.1
Bidding Requirements
1.1.1
Binding Dispute Resolution
8.3.1, 9.7, 11.5, 13.1, 15.1.2, 15.1.3, 15.2.1, 15.2.5, 15.2.6.1, 15.3.1, 15.3.2, 15.3.3, 15.4.1
Bonds, Lien
7.3.4.4, 9.6.8, 9.10.2, 9.10.3
Bonds, Performance, and Payment
7.3.4.4, 9.6.7, 9.10.3, **11.1.2**, 11.1.3, **11.5**
Building Information Models Use and Reliance
1.8
Building Permit
3.7.1
Capitalization
1.3
Certificate of Substantial Completion
9.8.3, 9.8.4, 9.8.5

Init.
/
AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

Certificates for Payment
4.2.1, 4.2.5, 4.2.9, 9.3.3, **9.4**, 9.5, 9.6.1, 9.6.6, 9.7, 9.10.1, 9.10.3, 14.1.1.3, 14.2.4, 15.1.4
Certificates of Inspection, Testing or Approval
13.4.4
Certificates of Insurance
9.10.2
Change Orders
1.1.1, 3.4.2, 3.7.4, 3.8.2.3, 3.11, 3.12.8, 4.2.8, 5.2.3, 7.1.2, 7.1.3, **7.2**, 7.3.2, 7.3.7, 7.3.9, 7.3.10, 8.3.1, 9.3.1.1, 9.10.3, 10.3.2, 11.2, 11.5, 12.1.2
Change Orders, Definition of
7.2.1
CHANGES IN THE WORK
2.2.2, 3.11, 4.2.8, **7**, 7.2.1, 7.3.1, 7.4, 8.3.1, 9.3.1.1, 11.5
Claims, Definition of
15.1.1
Claims, Notice of
1.6.2, 15.1.3
CLAIMS AND DISPUTES
3.2.4, 6.1.1, 6.3, 7.3.9, 9.3.3, 9.10.4, 10.3.3, **15**, 15.4
Claims and Timely Assertion of Claims
15.4.1
Claims for Additional Cost
3.2.4, 3.3.1, 3.7.4, 7.3.9, 9.5.2, 10.2.5, 10.3.2, **15.1.5**
Claims for Additional Time
3.2.4, 3.3.1, 3.7.4, 6.1.1, 8.3.2, 9.5.2, 10.3.2, **15.1.6**
Concealed or Unknown Conditions, Claims for
3.7.4
Claims for Damages
3.2.4, 3.18, 8.3.3, 9.5.1, 9.6.7, 10.2.5, 10.3.3, 11.3, 11.3.2, 14.2.4, 15.1.7
Claims Subject to Arbitration
15.4.1
Cleaning Up
3.15, 6.3
Commencement of the Work, Conditions Relating to
2.2.1, 3.2.2, 3.4.1, 3.7.1, 3.10.1, 3.12.6, 5.2.1, 5.2.3, 6.2.2, 8.1.2, 8.2.2, 8.3.1, 11.1, 11.2, **15.1.5**
Commencement of the Work, Definition of
8.1.2
Communications
3.9.1, **4.2.4**
Completion, Conditions Relating to
3.4.1, 3.11, 3.15, 4.2.2, 4.2.9, 8.2, 9.4.2, 9.8, 9.9.1, 9.10, 12.2, 14.1.2, 15.1.2
COMPLETION, PAYMENTS AND
9
Completion, Substantial
3.10.1, 4.2.9, 8.1.1, 8.1.3, 8.2.3, 9.4.2, 9.8, 9.9.1, 9.10.3, 12.2, 15.1.2
Compliance with Laws
2.3.2, 3.2.3, 3.6, 3.7, 3.12.10, 3.13, 9.6.4, 10.2.2, 13.1, 13.3, 13.4.1, 13.4.2, 13.5, 14.1.1, 14.2.1.3, 15.2.8, 15.4.2, 15.4.3
Concealed or Unknown Conditions
3.7.4, 4.2.8, 8.3.1, 10.3
Conditions of the Contract
1.1.1, 6.1.1, 6.1.4
Consent, Written
3.4.2, 3.14.2, 4.1.2, 9.8.5, 9.9.1, 9.10.2, 9.10.3, 13.2, 15.4.4.2
Consolidation or Joinder
15.4.4
CONSTRUCTION BY OWNER OR BY
SEPARATE CONTRACTORS
1.1.4, **6**
Construction Change Directive, Definition of
7.3.1
Construction Change Directives
1.1.1, 3.4.2, 3.11, 3.12.8, 4.2.8, 7.1.1, 7.1.2, 7.1.3, **7.3**, 9.3.1.1
Construction Schedules, Contractor's
3.10, 3.11, 3.12.1, 3.12.2, 6.1.3, 15.1.6.2
Contingent Assignment of Subcontracts
5.4, 14.2.2.2
Continuing Contract Performance
15.1.4
Contract, Definition of
1.1.2
CONTRACT, TERMINATION OR
SUSPENSION OF THE
5.4.1.1, 5.4.2, 11.5, **14**
Contract Administration
3.1.3, 4, 9.4, 9.5
Contract Award and Execution, Conditions Relating to
3.7.1, 3.10, 5.2, 6.1
Contract Documents, Copies Furnished and Use of
1.5.2, 2.3.6, 5.3
Contract Documents, Definition of
1.1.1
Contract Sum
2.2.2, 2.2.4, 3.7.4, 3.7.5, 3.8, 3.10.2, 5.2.3, 7.3, 7.4, **9.1**, 9.2, 9.4.2, 9.5.1.4, 9.6.7, 9.7, 10.3.2, 11.5, 12.1.2, 12.3, 14.2.4, 14.3.2, 15.1.4.2, **15.1.5, 15.2.5**
Contract Sum, Definition of
9.1
Contract Time
1.1.4, 2.2.1, 2.2.2, 3.7.4, 3.7.5, 3.10.2, 5.2.3, 6.1.5, 7.2.1.3, 7.3.1, 7.3.5, 7.3.6, 7, 7, 7.3.10, 7.4, 8.1.1, 8.2.1, 8.2.3, 8.3.1, 9.5.1, 9.7, 10.3.2, 12.1.1, 12.1.2, 14.3.2, 15.1.4.2, 15.1.6.1, 15.2.5
Contract Time, Definition of
8.1.1
CONTRACTOR
3
Contractor, Definition of
3.1, 6.1.2
Contractor's Construction and Submittal
Schedules
3.10, 3.12.1, 3.12.2, 4.2.3, 6.1.3, 15.1.6.2

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

Contractor's Employees
2.2.4, 3.3.2, 3.4.3, 3.8.1, 3.9, 3.18.2, 4.2.3, 4.2.6, 10.2, 10.3, 11.3, 14.1, 14.2.1.1
Contractor's Liability Insurance
11.1
Contractor's Relationship with Separate Contractors and Owner's Forces
3.12.5, 3.14.2, 4.2.4, 6, 11.3, 12.2.4
Contractor's Relationship with Subcontractors
1.2.2, 2.2.4, 3.3.2, 3.18.1, 3.18.2, 4.2.4, 5, 9.6.2, 9.6.7, 9.10.2, 11.2, 11.3, 11.4
Contractor's Relationship with the Architect
1.1.2, 1.5, 2.3.3, 3.1.3, 3.2.2, 3.2.3, 3.2.4, 3.3.1, 3.4.2, 3.5.1, 3.7.4, 3.10, 3.11, 3.12, 3.16, 3.18, 4.2, 5.2, 6.2.2, 7, 8.3.1, 9.2, 9.3, 9.4, 9.5, 9.7, 9.8, 9.9, 10.2.6, 10.3, 11.3, 12, 13.4, 15.1.3, 15.2.1
Contractor's Representations
3.2.1, 3.2.2, 3.5, 3.12.6, 6.2.2, 8.2.1, 9.3.3, 9.8.2
Contractor's Responsibility for Those Performing the Work
3.3.2, 3.18, 5.3, 6.1.3, 6.2, 9.5.1, 10.2.8
Contractor's Review of Contract Documents
3.2
Contractor's Right to Stop the Work
2.2.2, 9.7
Contractor's Right to Terminate the Contract
14.1
Contractor's Submittals
3.10, 3.11, 3.12, 4.2.7, 5.2.1, 5.2.3, 9.2, 9.3, 9.8.2, 9.8.3, 9.9.1, 9.10.2, 9.10.3
Contractor's Superintendent
3.9, 10.2.6
Contractor's Supervision and Construction Procedures
1.2.2, 3.3, 3.4, 3.12.10, 4.2.2, 4.2.7, 6.1.3, 6.2.4, 7.1.3, 7.3.4, 7.3.6, 8.2, 10, 12, 14, 15.1.4
Coordination and Correlation
1.2, 3.2.1, 3.3.1, 3.10, 3.12.6, 6.1.3, 6.2.1
Copies Furnished of Drawings and Specifications
1.5, 2.3.6, 3.11
Copyrights
1.5, **3.17**
Correction of Work
2.5, 3.7.3, 9.4.2, 9.8.2, 9.8.3, 9.9.1, 12.1.2, **12.2**, 12.3, 15.1.3.1, 15.1.3.2, 15.2.1
Correlation and Intent of the Contract Documents
1.2
Cost, Definition of
7.3.4
Costs
2.5, 3.2.4, 3.7.3, 3.8.2, 3.15.2, 5.4.2, 6.1.1, 6.2.3, 7.3.3.3, 7.3.4, 7.3.8, 7.3.9, 9.10.2, 10.3.2, 10.3.6, 11.2, 12.1.2, 12.2.1, 12.2.4, 13.4, 14
Cutting and Patching
3.14, 6.2.5
Damage to Construction of Owner or Separate Contractors
3.14.2, 6.2.4, 10.2.1.2, 10.2.5, 10.4, 12.2.4
Damage to the Work
3.14.2, 9.9.1, 10.2.1.2, 10.2.5, 10.4, 12.2.4
Damages, Claims for
3.2.4, 3.18, 6.1.1, 8.3.3, 9.5.1, 9.6.7, 10.3.3, 11.3.2, 11.3, 14.2.4, 15.1.7
Damages for Delay
6.2.3, 8.3.3, 9.5.1.6, 9.7, 10.3.2, 14.3.2
Date of Commencement of the Work, Definition of
8.1.2
Date of Substantial Completion, Definition of
8.1.3
Day, Definition of
8.1.4
Decisions of the Architect
3.7.4, 4.2.6, 4.2.7, 4.2.11, 4.2.12, 4.2.13, 6.3, 7.3.4, 7.3.9, 8.1.3, 8.3.1, 9.2, 9.4, 9.5.1, 9.8.4, 9.9.1, 13.4.2, 14.2.2, 14.2.4, 15.1, 15.2
Decisions to Withhold Certification
9.4.1, **9.5**, 9.7, 14.1.1.3
Defective or Nonconforming Work, Acceptance, Rejection and Correction of
2.5, 3.5, 4.2.6, 6.2.3, 9.5.1, 9.5.3, 9.6.6, 9.8.2, 9.9.3, 9.10.4, 12.2.1
Definitions
1.1, 2.1.1, 3.1.1, 3.5, 3.12.1, 3.12.2, 3.12.3, 4.1.1, 5.1, 6.1.2, 7.2.1, 7.3.1, 8.1, 9.1, 9.8.1, 15.1.1
Delays and Extensions of Time
3.2, **3.7.4**, 5.2.3, 7.2.1, 7.3.1, **7.4**, **8.3**, 9.5.1, **9.7**, 10.3.2, **10.4**, 14.3.2, **15.1.6**, 15.2.5
Digital Data Use and Transmission
1.7
Disputes
6.3, 7.3.9, 15.1, 15.2
Documents and Samples at the Site
3.11
Drawings, Definition of
1.1.5
Drawings and Specifications, Use and Ownership of
3.11
Effective Date of Insurance
8.2.2
Emergencies
10.4, 14.1.1.2, **15.1.5**
Employees, Contractor's
3.3.2, 3.4.3, 3.8.1, 3.9, 3.18.2, 4.2.3, 4.2.6, 10.2, 10.3.3, 11.3, 14.1, 14.2.1.1
Equipment, Labor, or Materials
1.1.3, 1.1.6, 3.4, 3.5, 3.8.2, 3.8.3, 3.12, 3.13, 3.15.1, 4.2.6, 4.2.7, 5.2.1, 6.2.1, 7.3.4, 9.3.2, 9.3.3, 9.5.1.3, 9.10.2, 10.2.1, 10.2.4, 14.2.1.1, 14.2.1.2
Execution and Progress of the Work
1.1.3, 1.2.1, 1.2.2, 2.3.4, 2.3.6, 3.1, 3.3.1, 3.4.1, 3.7.1, 3.10.1, 3.12, 3.14, 4.2, 6.2.2, 7.1.3, 7.3.6, 8.2, 9.5.1, 9.9.1, 10.2, 10.3, 12.1, 12.2, 14.2, 14.3.1, 15.1.4

Init.
/
AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

Extensions of Time
3.2.4, 3.7.4, 5.2.3, 7.2.1, 7.3, 7.4, 9.5.1, 9.7, 10.3.2, 10.4, 14.3, 15.1.6, **15.2.5**
Failure of Payment
9.5.1.3, **9.7**, 9.10.2, 13.5, 14.1.1.3, 14.2.1.2
Faulty Work
(See Defective or Nonconforming Work)
Final Completion and Final Payment
4.2.1, 4.2.9, 9.8.2, **9.10**, 12.3, 14.2.4, 14.4.3
Financial Arrangements, Owner's
2.2.1, 13.2.2, 14.1.1.4
GENERAL PROVISIONS
1
Governing Law
13.1
Guarantees (See Warranty)
Hazardous Materials and Substances
10.2.4, **10.3**
Identification of Subcontractors and Suppliers
5.2.1
Indemnification
3.17, **3.18**, 9.6.8, 9.10.2, 10.3.3, 11.3
Information and Services Required of the Owner
2.1.2, **2.2**, 2.3, 3.2.2, 3.12.10.1, 6.1.3, 6.1.4, 6.2.5, 9.6.1, 9.9.2, 9.10.3, 10.3.3, 11.2, 13.4.1, 13.4.2, 14.1.1.4, 14.1.4, 15.1.4
Initial Decision
15.2
Initial Decision Maker, Definition of
1.1.8
Initial Decision Maker, Decisions
14.2.4, 15.1.4.2, 15.2.1, 15.2.2, 15.2.3, 15.2.4, 15.2.5
Initial Decision Maker, Extent of Authority
14.2.4, 15.1.4.2, 15.2.1, 15.2.2, 15.2.3, 15.2.4, 15.2.5
Injury or Damage to Person or Property
10.2.8, 10.4
Inspections
3.1.3, 3.3.3, 3.7.1, 4.2.2, 4.2.6, 4.2.9, 9.4.2, 9.8.3, 9.9.2, 9.10.1, 12.2.1, 13.4
Instructions to Bidders
1.1.1
Instructions to the Contractor
3.2.4, 3.3.1, 3.8.1, 5.2.1, 7, 8.2.2, 12, 13.4.2
Instruments of Service, Definition of
1.1.7
Insurance
6.1.1, 7.3.4, 8.2.2, 9.3.2, 9.8.4, 9.9.1, 9.10.2, 10.2.5, **11**
Insurance, Notice of Cancellation or Expiration
11.1.4, 11.2.3
Insurance, Contractor's Liability
11.1
Insurance, Effective Date of
8.2.2, 14.4.2
Insurance, Owner's Liability
11.2
Insurance, Property
10.2.5, 11.2, 11.4, 11.5
Insurance, Stored Materials
9.3.2
INSURANCE AND BONDS
11
Insurance Companies, Consent to Partial Occupancy
9.9.1
Insured loss, Adjustment and Settlement of
11.5
Intent of the Contract Documents
1.2.1, 4.2.7, 4.2.12, 4.2.13
Interest
13.5
Interpretation
1.1.8, 1.2.3, **1.4**, 4.1.1, 5.1, 6.1.2, 15.1.1
Interpretations, Written
4.2.11, 4.2.12
Judgment on Final Award
15.4.2
Labor and Materials, Equipment
1.1.3, 1.1.6, **3.4**, 3.5, 3.8.2, 3.8.3, 3.12, 3.13, 3.15.1, 5.2.1, 6.2.1, 7.3.4, 9.3.2, 9.3.3, 9.5.1.3, 9.10.2, 10.2.1, 10.2.4, 14.2.1.1, 14.2.1.2
Labor Disputes
8.3.1
Laws and Regulations
1.5, 2.3.2, 3.2.3, 3.2.4, 3.6, 3.7, 3.12.10, 3.13, 9.6.4, 9.9.1, 10.2.2, 13.1, 13.3.1, 13.4.2, 13.5, 14, 15.2.8, 15.4
Liens
2.1.2, 9.3.1, 9.3.3, 9.6.8, 9.10.2, 9.10.4, 15.2.8
Limitations, Statutes of
12.2.5, 15.1.2, 15.4.1.1
Limitations of Liability
3.2.2, 3.5, 3.12.10, 3.12.10.1, 3.17, 3.18.1, 4.2.6, 4.2.7, 6.2.2, 9.4.2, 9.6.4, 9.6.7, 9.6.8, 10.2.5, 10.3.3, 11.3, 12.2.5, 13.3.1
Limitations of Time
2.1.2, 2.2, 2.5, 3.2.2, 3.10, 3.11, 3.12.5, 3.15.1, 4.2.7, 5.2, 5.3, 5.4.1, 6.2.4, 7.3, 7.4, 8.2, 9.2, 9.3.1, 9.3.3, 9.4.1, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 12.2, 13.4, 14, 15, 15.1.2, 15.1.3, 15.1.5
Materials, Hazardous
10.2.4, **10.3**
Materials, Labor, Equipment and
1.1.3, 1.1.6, 3.4.1, 3.5, 3.8.2, 3.8.3, 3.12, 3.13, 3.15.1, 5.2.1, 6.2.1, 7.3.4, 9.3.2, 9.3.3, 9.5.1.3, 9.10.2, 10.2.1.2, 10.2.4, 14.2.1.1, 14.2.1.2
Means, Methods, Techniques, Sequences and Procedures of Construction
3.3.1, 3.12.10, 4.2.2, 4.2.7, 9.4.2
Mechanic's Lien
2.1.2, 9.3.1, 9.3.3, 9.6.8, 9.10.2, 9.10.4, 15.2.8
Mediation
8.3.1, 15.1.3.2, 15.2.1, 15.2.5, 15.2.6, **15.3**, 15.4.1, 15.4.1.1
Minor Changes in the Work
1.1.1, 3.4.2, 3.12.8, 4.2.8, 7.1, **7.4**

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

MISCELLANEOUS PROVISIONS
13
Modifications, Definition of
1.1.1
Modifications to the Contract
1.1.1, 1.1.2, 2.5, 3.11, 4.1.2, 4.2.1, 5.2.3, 7, 8.3.1, 9.7, 10.3.2
Mutual Responsibility
6.2
Nonconforming Work, Acceptance of
9.6.6, 9.9.3, **12.3**
Nonconforming Work, Rejection and Correction of
2.4, 2.5, 3.5, 4.2.6, 6.2.4, 9.5.1, 9.8.2, 9.9.3, 9.10.4, 12.2
Notice
1.6, 1.6.1, 1.6.2, 2.1.2, 2.2.2., 2.2.3, 2.2.4, 2.5, 3.2.4, 3.3.1, 3.7.4, 3.7.5, 3.9.2, 3.12.9, 3.12.10, 5.2.1, 7.4, 8.2.2 9.6.8, 9.7, 9.10.1, 10.2.8, 10.3.2, 11.5, 12.2.2.1, 13.4.1, 13.4.2, 14.1, 14.2.2, 14.4.2, 15.1.3, 15.1.5, 15.1.6, 15.4.1
Notice of Cancellation or Expiration of Insurance
11.1.4, 11.2.3
Notice of Claims
1.6.2, 2.1.2, 3.7.4, 9.6.8, 10.2.8, **15.1.3**, 15.1.5, 15.1.6, 15.2.8, 15.3.2, 15.4.1
Notice of Testing and Inspections
13.4.1, 13.4.2
Observations, Contractor's
3.2, 3.7.4
Occupancy
2.3.1, 9.6.6, 9.8
Orders, Written
1.1.1, 2.4, 3.9.2, 7, 8.2.2, 11.5, 12.1, 12.2.2.1, 13.4.2, 14.3.1
OWNER
2
Owner, Definition of
2.1.1
Owner, Evidence of Financial Arrangements
2.2, 13.2.2, 14.1.1.4
Owner, Information and Services Required of the
2.1.2, **2.2**, 2.3, 3.2.2, 3.12.10, 6.1.3, 6.1.4, 6.2.5, 9.3.2, 9.6.1, 9.6.4, 9.9.2, 9.10.3, 10.3.3, 11.2, 13.4.1, 13.4.2, 14.1.1.4, 14.1.4, 15.1.4
Owner's Authority
1.5, 2.1.1, 2.3.32.4, 2.5, 3.4.2, 3.8.1, 3.12.10, 3.14.2, 4.1.2, 4.2.4, 4.2.9, 5.2.1, 5.2.4, 5.4.1, 6.1, 6.3, 7.2.1, 7.3.1, 8.2.2, 8.3.1, 9.3.2, 9.5.1, 9.6.4, 9.9.1, 9.10.2, 10.3.2, 11.4, 11.5, 12.2.2, 12.3, 13.2.2, 14.3, 14.4, 15.2.7
Owner's Insurance
11.2
Owner's Relationship with Subcontractors
1.1.2, 5.2, 5.3, 5.4, 9.6.4, 9.10.2, 14.2.2
Owner's Right to Carry Out the Work
2.5, 14.2.2
Owner's Right to Clean Up
6.3
Owner's Right to Perform Construction and to Award Separate Contracts
6.1
Owner's Right to Stop the Work
2.4
Owner's Right to Suspend the Work
14.3
Owner's Right to Terminate the Contract
14.2, 14.4
Ownership and Use of Drawings, Specifications and Other Instruments of Service
1.1.1, 1.1.6, 1.1.7, **1.5**, 2.3.6, 3.2.2, 3.11, 3.17, 4.2.12, 5.3
Partial Occupancy or Use
9.6.6, **9.9**
Patching, Cutting and
3.14, 6.2.5
Patents
3.17
Payment, Applications for
4.2.5, 7.3.9, 9.2, **9.3**, 9.4, 9.5, 9.6.3, 9.7, 9.8.5, 9.10.1, 14.2.3, 14.2.4, 14.4.3
Payment, Certificates for
4.2.5, 4.2.9, 9.3.3, **9.4**, 9.5, 9.6.1, 9.6.6, 9.7, 9.10.1, 9.10.3, 14.1.1.3, 14.2.4
Payment, Failure of
9.5.1.3, **9.7**, 9.10.2, 13.5, 14.1.1.3, 14.2.1.2
Payment, Final
4.2.1, 4.2.9, **9.10**, 12.3, 14.2.4, 14.4.3
Payment Bond, Performance Bond and
7.3.4.4, 9.6.7, 9.10.3, **11.1.2**
Payments, Progress
9.3, **9.6**, 9.8.5, 9.10.3, 14.2.3, 15.1.4
PAYMENTS AND COMPLETION
9
Payments to Subcontractors
5.4.2, 9.5.1.3, 9.6.2, 9.6.3, 9.6.4, 9.6.7, 14.2.1.2
PCB
10.3.1
Performance Bond and Payment Bond
7.3.4.4, 9.6.7, 9.10.3, **11.1.2**
Permits, Fees, Notices and Compliance with Laws
2.3.1, **3.7**, 3.13, 7.3.4.4, 10.2.2
PERSONS AND PROPERTY, PROTECTION OF
10
Polychlorinated Biphenyl
10.3.1
Product Data, Definition of
3.12.2
Product Data and Samples, Shop Drawings
3.11, **3.12**, 4.2.7
Progress and Completion
4.2.2, **8.2**, 9.8, 9.9.1, 14.1.4, 15.1.4
Progress Payments
9.3, **9.6**, 9.8.5, 9.10.3, 14.2.3, 15.1.4

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

Project, Definition of
1.1.4
Project Representatives
4.2.10
Property Insurance
10.2.5, **11.2**
Proposal Requirements
1.1.1
PROTECTION OF PERSONS AND PROPERTY
10
Regulations and Laws
1.5, 2.3.2, 3.2.3, 3.6, 3.7, 3.12.10, 3.13, 9.6.4, 9.9.1, 10.2.2, 13.1, 13.3, 13.4.1, 13.4.2, 13.5, 14, 15.2.8, 15.4
Rejection of Work
4.2.6, 12.2.1
Releases and Waivers of Liens
9.3.1, 9.10.2
Representations
3.2.1, 3.5, 3.12.6, 8.2.1, 9.3.3, 9.4.2, 9.5.1, 9.10.1
Representatives
2.1.1, 3.1.1, 3.9, 4.1.1, 4.2.10, 13.2.1
Responsibility for Those Performing the Work
3.3.2, 3.18, 4.2.2, 4.2.3, 5.3, 6.1.3, 6.2, 6.3, 9.5.1, 10
Retainage
9.3.1, 9.6.2, 9.8.5, 9.9.1, 9.10.2, 9.10.3
Review of Contract Documents and Field Conditions by Contractor
3.2, 3.12.7, 6.1.3
Review of Contractor's Submittals by Owner and Architect
3.10.1, 3.10.2, 3.11, 3.12, 4.2, 5.2, 6.1.3, 9.2, 9.8.2
Review of Shop Drawings, Product Data and Samples by Contractor
3.12
Rights and Remedies
1.1.2, 2.4, 2.5, 3.5, 3.7.4, 3.15.2, 4.2.6, 5.3, 5.4, 6.1, 6.3, 7.3.1, 8.3, 9.5.1, 9.7, 10.2.5, 10.3, 12.2.1, 12.2.2, 12.2.4, **13.3**, 14, 15.4
Royalties, Patents and Copyrights
3.17
Rules and Notices for Arbitration
15.4.1
Safety of Persons and Property
10.2, 10.4
Safety Precautions and Programs
3.3.1, 4.2.2, 4.2.7, 5.3, **10.1**, 10.2, 10.4
Samples, Definition of
3.12.3
Samples, Shop Drawings, Product Data and
3.11, **3.12**, 4.2.7
Samples at the Site, Documents and
3.11
Schedule of Values
9.2, 9.3.1
Schedules, Construction
3.10, 3.12.1, 3.12.2, 6.1.3, 15.1.6.2
Separate Contracts and Contractors
1.1.4, 3.12.5, 3.14.2, 4.2.4, 4.2.7, 6, 8.3.1, 12.1.2
Separate Contractors, Definition of
6.1.1
Shop Drawings, Definition of
3.12.1
Shop Drawings, Product Data and Samples
3.11, **3.12**, 4.2.7
Site, Use of
3.13, 6.1.1, 6.2.1
Site Inspections
3.2.2, 3.3.3, 3.7.1, 3.7.4, 4.2, 9.9.2, 9.4.2, 9.10.1, 13.4
Site Visits, Architect's
3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.5.1, 9.9.2, 9.10.1, 13.4
Special Inspections and Testing
4.2.6, 12.2.1, 13.4
Specifications, Definition of
1.1.6
Specifications
1.1.1, **1.1.6**, 1.2.2, 1.5, 3.12.10, 3.17, 4.2.14
Statute of Limitations
15.1.2, 15.4.1.1
Stopping the Work
2.2.2, 2.4, 9.7, 10.3, 14.1
Stored Materials
6.2.1, 9.3.2, 10.2.1.2, 10.2.4
Subcontractor, Definition of
5.1.1
SUBCONTRACTORS
5
Subcontractors, Work by
1.2.2, 3.3.2, 3.12.1, 3.18, 4.2.3, 5.2.3, 5.3, 5.4, 9.3.1.2, 9.6.7
Subcontractual Relations
5.3, 5.4, 9.3.1.2, 9.6, 9.10, 10.2.1, 14.1, 14.2.1
Submittals
3.10, 3.11, 3.12, 4.2.7, 5.2.1, 5.2.3, 7.3.4, 9.2, 9.3, 9.8, 9.9.1, 9.10.2, 9.10.3
Submittal Schedule
3.10.2, 3.12.5, 4.2.7
Subrogation, Waivers of
6.1.1, **11.3**
Substances, Hazardous
10.3
Substantial Completion
4.2.9, 8.1.1, 8.1.3, 8.2.3, 9.4.2, **9.8**, 9.9.1, 9.10.3, 12.2, 15.1.2
Substantial Completion, Definition of
9.8.1
Substitution of Subcontractors
5.2.3, 5.2.4
Substitution of Architect
2.3.3
Substitutions of Materials
3.4.2, 3.5, 7.3.8
Sub-subcontractor, Definition of
5.1.2

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

Subsurface Conditions
3.7.4
Successors and Assigns
13.2
Superintendent
3.9, 10.2.6
Supervision and Construction Procedures
1.2.2, **3.3**, 3.4, 3.12.10, 4.2.2, 4.2.7, 6.1.3, 6.2.4, 7.1.3, 7.3.4, 8.2, 8.3.1, 9.4.2, 10, 12, 14, 15.1.4
Suppliers
1.5, 3.12.1, 4.2.4, 4.2.6, 5.2.1, 9.3, 9.4.2, 9.5.4, 9.6, 9.10.5, 14.2.1
Surety
5.4.1.2, 9.6.8, 9.8.5, 9.10.2, 9.10.3, 11.1.2, 14.2.2, 15.2.7
Surety, Consent of
9.8.5, 9.10.2, 9.10.3
Surveys
1.1.7, 2.3.4
Suspension by the Owner for Convenience
14.3
Suspension of the Work
3.7.5, 5.4.2, 14.3
Suspension or Termination of the Contract
5.4.1.1, 14
Taxes
3.6, 3.8.2.1, 7.3.4.4
Termination by the Contractor
14.1, 15.1.7
Termination by the Owner for Cause
5.4.1.1, **14.2,** 15.1.7
Termination by the Owner for Convenience
14.4
Termination of the Architect
2.3.3
Termination of the Contractor Employment
14.2.2

TERMINATION OR SUSPENSION OF THE CONTRACT
14
Tests and Inspections
3.1.3, 3.3.3, 3.7.1, 4.2.2, 4.2.6, 4.2.9, 9.4.2, 9.8.3, 9.9.2, 9.10.1, 10.3.2, 12.2.1, **13.4**
TIME
8
Time, Delays and Extensions of
3.2.4, 3.7.4, 5.2.3, 7.2.1, 7.3.1, 7.4, **8.3**, 9.5.1, 9.7, 10.3.2, 10.4, 14.3.2, 15.1.6, 15.2.5
Time Limits
2.1.2, 2.2, 2.5, 3.2.2, 3.10, 3.11, 3.12.5, 3.15.1, 4.2, 5.2, 5.3, 5.4, 6.2.4, 7.3, 7.4, 8.2, 9.2, 9.3.1, 9.3.3, 9.4.1, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 12.2, 13.4, 14, 15.1.2, 15.1.3, 15.4
Time Limits on Claims
3.7.4, 10.2.8, 15.1.2, 15.1.3
Title to Work
9.3.2, 9.3.3
UNCOVERING AND CORRECTION OF WORK
12
Uncovering of Work
12.1
Unforeseen Conditions, Concealed or Unknown
3.7.4, 8.3.1, 10.3
Unit Prices
7.3.3.2, 9.1.2
Use of Documents
1.1.1, 1.5, 2.3.6, 3.12.6, 5.3
Use of Site
3.13, 6.1.1, 6.2.1
Values, Schedule of
9.2, 9.3.1
Waiver of Claims by the Architect
13.3.2
Waiver of Claims by the Contractor
9.10.5, 13.3.2, **15.1.7**
Waiver of Claims by the Owner
9.9.3, 9.10.3, 9.10.4, 12.2.2.1, 13.3.2, 14.2.4, **15.1.7**
Waiver of Consequential Damages
14.2.4, 15.1.7
Waiver of Liens
9.3, 9.10.2, 9.10.4
Waivers of Subrogation
6.1.1, **11.3**
Warranty
3.5, 4.2.9, 9.3.3, 9.8.4, 9.9.1, 9.10.2, 9.10.4, 12.2.2, 15.1.2
Weather Delays
8.3, 15.1.6.2
Work, Definition of
1.1.3
Written Consent
1.5.2, 3.4.2, 3.7.4, 3.12.8, 3.14.2, 4.1.2, 9.3.2, 9.10.3, 13.2, 13.3.2, 15.4.4.2
Written Interpretations
4.2.11, 4.2.12
Written Orders
1.1.1, 2.4, 3.9, 7, 8.2.2, 12.1, 12.2, 13.4.2, 14.3.1

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.

§ 1.1.2 The Contract

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

§ 1.1.3 The Work

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

§ 1.1.5 The Drawings

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

§ 1.1.6 The Specifications

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 Instruments of Service

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

§ 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 Interpretation

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon written protocols governing the transmission and use of, and reliance on, Instruments of Service or any other information or documentation in digital form.

(Paragraphs deleted)

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 Evidence of the Owner's Financial Arrangements

§ 2.2.1 Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.4 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

§ 2.3 Information and Services Required of the Owner

§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

§ 2.3.5 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

ARTICLE 3 CONTRACTOR

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects,

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.6 Taxes

The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

.1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

.2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and

.3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 Shop Drawings, Product Data and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

§ 3.13 Use of Site

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 Access to Work

The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress wherever located.

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

ARTICLE 4 ARCHITECT

§ 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

§ 4.1.2 Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

§ 4.2 Administration of the Contract

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 Communications

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 Subcontractual Relations

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

- **.1** assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and
- **.2** assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

§ 7.2 Change Orders

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:

- **.1** The change in the Work;
- **.2** The amount of the adjustment, if any, in the Contract Sum; and
- **.3** The extent of the adjustment, if any, in the Contract Time.

§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- **.1** Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- **.2** Unit prices stated in the Contract Documents or subsequently agreed upon;
- **.3** Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- **.4** As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

- **.1** Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;
- **.2** Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
- **.3** Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
- **.4** Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
- **.5** Costs of supervision and field office personnel directly attributable to the change.

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME

§ 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 Schedule of Values

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

§ 9.3 Applications for Payment

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

§ 9.4 Certificates for Payment

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- **.1** defective Work not remedied;
- **.2** third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
- **.3** failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;
- **.4** reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- **.5** damage to the Owner or a Separate Contractor;
- **.6** reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- **.7** repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

§ 9.5.3 When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

§ 9.7 Failure of Payment

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

§ 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- **.1** liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
- **.2** failure of the Work to comply with the requirements of the Contract Documents;
- **.3** terms of special warranties required by the Contract Documents; or
- **.4** audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

- **.1** employees on the Work and other persons who may be affected thereby;
- **.2** the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and
- **.3** other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 Injury or Damage to Person or Property

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 Hazardous Materials and Substances

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims,

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

§ 11.2.2 Failure to Purchase Required Property Insurance. If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 Notice of Cancellation or Expiration of Owner's Required Property Insurance. Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

§ 11.3 Waivers of Subrogation

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

§11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

§ 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

- **.1** Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- **.2** An act of government, such as a declaration of national emergency, that requires all Work to be stopped;
- **.3** Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- **.4** The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- **.1** repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- **.2** fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
- **.3** repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- **.4** otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- **.1** Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- **.2** Accept assignment of subcontracts pursuant to Section 5.4; and
- **.3** Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

- **.1** that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
- **.2** that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- **.1** cease operations as directed by the Owner in the notice;
- **.2** take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- **.3** except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.

§ 15.1.7 Waiver of Claims for Consequential Damages

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

.1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

.2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 Arbitration

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 Consolidation or Joinder

§ 15.4.4.1 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

§ 15.4.4.2 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.

AIA Document A201 – 2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007 and 2017. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 16:32:16 ET on 03/03/2026 under Order No.500026793_2 which expires on 01/23/2027, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1447113044)

DOCUMENT 007300 - SUPPLEMENTARY CONDITIONS

PART 1 - GENERAL

1.1 ARTICLE 3 CONTRACTOR

A. § 3.18 Indemnification

1. Add the following sentence to the end of Section 3.18.1:

a. The Contractor shall indemnify and hold harmless the Federal Government, its employees, and/or their contractors, The Florida Division of Emergency Management, its employees and/or their contractors, and the Sub-Recipient (Owner) and its employees and/or their contractors from liability to third parties for claims asserted under this contract.

1.2 ARTICLE 9 PAYMENTS AND COMPLETION

A. § 9.3 Applications for Payment

1. Add Section 9.3.1.3.

a. The Owner shall retain five percent (5%) of the amount of progress payments until completion and acceptance of all work under the Contract including the receipt of all required Closeout Documents.

B. § 9.8 Substantial Completion

1. Add Section 9.8.1.1.

a. § 9.8.1.1 Substantial Completion shall also include final approval for occupancy and use by authorities having jurisdiction.

1.3 ARTICLE 13 MISCELLANEOUS PROVISIONS

A. Add Section 13.6.

1. § 13.6 Special Conditions

a. See Owner's Special Conditions document(s) appended to and made a part of these Supplementary Conditions, which include the following:

1) § 13.6.1 Provisions Required by law.
2) § 13.6.2 Other Required Provisions.

1.4 ARTICLE 16 LIQUIDATED DAMAGES

A. Add Article 16.

B. § 16.1 The Owner and Contractor recognize that time is of the essence to this Contract and that a delay in achieving Substantial Completion or Final Completion is a breach and will cause damages to the Owner. Such damages include, but are not limited to, the following:

1. .1 delayed or diminished use of facility;
2. .2 inconvenience to facility users;
3. .3 increased inspection, oversight, and administrative costs to the Owner;
4. .4 diversion of the Owner's employees from other tasks and projects.;
5. .5 increased and extended project overhead;
6. .6 inefficiencies and loss of productivity;

C. § 16.2 The parties acknowledge that said damages are likely to occur but would be difficult to ascertain or determine, and that a legal proceeding to prove such damages would be time consuming and expensive. Therefore, in the event of delayed performance of the Work, the following amounts will be charged against the Contractor, as liquidated damages and not as a penalty:

1. .1 The amount of $ 250 per calendar day for Project for failing to meet the Substantial Completion Date , calculated until Substantial Completion is achieved.

D. § 16.4 The Owner may withhold liquidated damages from any payment to Contractor. Making final payment shall constitute a waiver of the Owner's right to liquidated damages not withheld unless the right to assess liquidated damages is specifically reserved in writing by the Owner. The Owner's entitlement to liquidated damages is specifically reserved in writing by Owner. The Owner's entitlement to liquidated damages shall not be considered a "Claim" subject to the time limitation for asserting Claims, but rather accrues automatically upon the Contractor's failure to meet the Substantial Completion Date and/or Final Completion Date.

E. § 16.5 Liquidated damages shall not be assessed for the Contractor's delayed performance if and to the extent the delay is due to acts or omissions of the Owner or Owner's Separate Contractors on the Project, or to other events beyond the Contactor's control. Provided, however, that the Contract provides a procedure by which the Contractor may make a Claim for an increase in the Contract Time, and it is Contractor's responsibility to follow the Claim procedure in a timely manner to obtain additional time to perform. Provided further, that failure by the Contractor to timely Claim and obtain additional time under said Contract procedure constitutes a waiver, in which case the Owner shall be entitled to liquidated damages for delayed performance without any need for the Owner to establish that the Contractor was responsible for the delay.

F. § 16.6 The Owner's entitlement to liquidated damages from Contractor shall be governed by these liquidated damages provision and shall not be affected by or offset by the Owner's assessment of liquidated damages against any other contractor.

G. § 16.7 The parties acknowledge that these liquidated damages provisions are not intended to apply to all additional costs incurred by Owner because of breach or delay. Specifically, these

liquidated damages provisions do not apply to additional costs incurred by Owner for correction of defective work or completion of the Contract; additional legal, design professional and construction management costs resulting from breach or delay; and any claims by Owner's Separate Contractors resulting from breach or delay. Such damages, losses, and expenses are likely to be ascertainable in the event of a breach and are thus outside the scope of these liquidated damages provisions. The parties agree that the Owner's right to recover liquidated damages for delay is in addition to, and not in lieu of recovery of, such ascertainable items of damages.

H. § 16.8 The Owner's right to liquidated damages shall not be affected or waived by the Owner's termination of the Contract upon material breach by the Contractor, or by the Owner permitting the Contractor to continue and finish the Work or any part thereof after expiration of specified completion dates.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF DOCUMENT 007300

DOCUMENT 007400 – SPECIAL CONDITIONS

PART 1 - GENERAL

1.1 SUPPLEMENTARY CONTRACT PROVISIONS REQUIRED BY FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) UNDER THE UNIFORM ADMINISTRATIVE REQUIREMENTS, COST PRINCIPLES, AND AUDIT REQUIREMENTS FOR FEDERAL AWARDS

A. INTRODUCTION

1. The Owner is, or expects to be, the recipient or a sub-recipient of Federal public assistance funding provided by FEMA under the Public Assistance program; and thus, the Owner is required to comply with the Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards ("Uniform Rules") at 2 CFR. Part 200, as adopted by the Department of Homeland Security ("DHS") at 2 CFR Part 3002, and the Terms and Conditions of the FEMA Grant and other FEMA Regulatory Guidance.
2. The following Contract provisions are required to be included in all contracts in connection with the Project when the Project will be funded, in whole or in part, with Federal FEMA funds. These provisions are hereby incorporated in any Contract in connection with the Project between the Owner and any of the following: any Prime Contractor and any Construction or Material Suppliers (all of which are referred herein as "Contractor" and/or "Contracting Party") contracted directly by the Owner ("Underlying Agreements"). In addition, these parties in privity with the Owner shall include these provisions (as required below) in any subcontracts entered into in connection with the Project; as well as a clause requiring the subcontractors to include these clauses in any lower tier subcontracts related to the Project. The Prime Contractor shall be responsible for the compliance by any subcontractor or lower-tier subcontractor with all these contract clauses.
3. These Contract provisions shall supplement, modify, amend, and/or replace provisions in the Underlying Agreements, as applicable, and control to the extent of any conflict with the standard provisions of the Underlying Agreements, including any General Conditions applicable thereto, unless the provisions of the Underlying Agreements require a more stringent standard. Where a portion of the Underlying Agreements is not supplemented, modified, amended, and/or deleted by these provisions, such unaltered portions of the Underlying Agreements shall remain in effect.

B. DEFINITIONS USED IN THESE SUPPLEMENTARY CONTRACT PROVISIONS

1. Work. The term "Work" means the construction services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project(s).
2. Project. The Project, is the Project or Projects specified above and includes the total construction of which the Work performed under the Contract Documents may be the

Copyright © 2024 by the American Institute of Architects. Warning: This AIA MasterSpec based document is protected by U.S. Copyright Law and International Treaties. A valid, current MasterSpec license is required for editing or use of this document.

whole or a part and which may include construction by the Owner and by Separate Contractors.

3. Drawings. The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.
4. Specifications. The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services. Where noted above, the Specifications may be those prepared by the Owner and appended to the Contract.

C. DISCLOSURES AND CERTIFICATIONS

1. Contractor acknowledges that federal funds will be utilized to fund the Work under this Contract. Contractor warrants and certifies that it will abide by all applicable federal laws, rules, and regulations, executive orders, OMB circulars, policies, procedures and directives applicable to the Contract, terms and conditions of the Owner's FEMA Grant and any FEMA-approved application and provisions of the Contract, including but not limited to the following:

D. 2 CFR PART 200 PROVISIONS

1. Contractual Remedies

a. If this Contract is for an amount which exceeds the Simplified Acquisition Threshold currently set at $350,000, the Contactor agrees, in addition to abiding by the Termination Provisions in the following paragraphs, to comply with all administrative, contractual, or legal remedies and other sanctions and penalties for violation or breach contained in the Contract Documents in instances where the Contractor violates or breaches the Contract terms.

2. Termination

a. Termination for Convenience: Notwithstanding any provision to the contrary contained in this Contract, if this Contract is for an amount greater than $10,000, the Owner reserves the right to terminate this Contract for convenience with 7 days' notice in writing to Contractor. In such event, the Contractor will be compensated only for services actually performed and reimbursable expenses actually incurred prior to termination.
b. Termination for Cause: The Owner may terminate the Contract upon not less than seven days' written notice should the other party fail substantially to perform in accordance with the terms of this Agreement through no fault of the party initiating the termination.

3. Equal Employment Opportunity

a. During the performance of this contract, the contractor agrees as follows:

1) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation,

Copyright © 2024 by the American Institute of Architects. Warning: This AIA MasterSpec based document is protected by U.S. Copyright Law and International Treaties. A valid, current MasterSpec license is required for editing or use of this document.

gender identity, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

2) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.
3) The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.
4) The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
5) The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
6) The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
7) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965,

Copyright © 2024 by the American Institute of Architects. Warning: This AIA MasterSpec based document is protected by U.S. Copyright Law and International Treaties. A valid, current MasterSpec license is required for editing or use of this document.

and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

8) The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance:

Provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

The applicant further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work: *Provided,* That if the applicant so participating is a State or local government, the above equal opportunity clause is not applicable to any agency, instrumentality or subdivision of such government which does not participate in work on or under the contract.

The applicant agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of contractors and subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish the administering agency and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist the administering agency in the discharge of the agency's primary responsibility for securing compliance.

The applicant further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a contractor debarred from, or who has not demonstrated eligibility for, Government contracts and federally assisted construction contracts pursuant to the Executive Order and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and subcontractors by the administering agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive Order. In addition, the applicant agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any or all of the following actions: Cancel, terminate, or suspend in whole or in part this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the applicant under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance

Copyright © 2024 by the American Institute of Architects. Warning: This AIA MasterSpec based document is protected by U.S. Copyright Law and International Treaties. A valid, current MasterSpec license is required for editing or use of this document.

has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

4. Contract Work Hours and Safety Standards Act (40 USC 3701-3708)

a. To the extent that this Contract is for a Contract Sum greater than $100,000 and involves the employment of mechanics or laborers, Contractor shall comply with 40 USC 3702 and 3704, as supplemented by the Department of Labor regulations (29 CFT Part 5):

1) *Overtime requirements.* No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2) *Violation; liability for unpaid wages; liquidated damages.* In the event of any violation of the clause set forth in paragraph (b)(1) of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated
damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (b)(1) of this section, in the sum of $27 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (b)(1) of this section.

3) *Withholding for unpaid wages and liquidated damages.* FEMA or Owner shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.

4) *Subcontracts.* The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (b)(1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be

Copyright © 2024 by the American Institute of Architects. Warning: This AIA MasterSpec based document is protected by U.S. Copyright Law and International Treaties. A valid, current MasterSpec license is required for editing or use of this document.

responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (b)(1) through (4) of this section.

5. Clean Air Act and the Federal Water Pollution Control Act

a. If the Contract Sum of this Contract is greater than $150,000, Contractor agrees as follows:

b. Clean Air Act

1) The contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. § 7401 et seq.
2) The contractor agrees to report each violation to the Owner and understands and agrees that the Owner will, in turn, report each violation as required to assure notification to the Federal Emergency Management Agency, and the appropriate Environmental Protection Agency Regional Office.
3) The contractor agrees to include these requirements in each subcontract exceeding $150,000 financed in whole or in part with Federal assistance provided by FEMA.

c. Federal Water Pollution Control Act

1) The contractor agrees to comply with all applicable standards, orders, or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq.
2) The contractor agrees to report each violation to the Owner and understands and agrees that the Owner will, in turn, report each violation as required to assure notification to the Federal Emergency Management Agency, and the appropriate Environmental Protection Agency Regional Office.
3) The contractor agrees to include these requirements in each subcontract exceeding $150,000 financed in whole or in part with Federal assistance provided by FEMA.

6. Debarment and Suspension

a. This contract is a covered transaction for purposes of 2 C.F.R. pt. 180 and 2 C.F.R. pt. 3000. As such, the contractor is required to verify that none of the contractor's principals (defined at 2 C.F.R. § 180.995) or its affiliates (defined at 2 C.F.R. § 180.905) are excluded (defined at 2 C.F.R. § 180.940) or disqualified (defined at 2 C.F.R. § 180.935).
b. The contractor must comply with 2 C.F.R. pt. 180, subpart C and2 C.F.R. pt. 3000, subpart C, and must include a requirement to comply with these regulations in any lower tier covered transaction it enters into.
c. This certification is a material representation of fact relied upon by the Owner. If it is later determined that the contractor did not comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, in addition to remedies available to the

Copyright © 2024 by the American Institute of Architects. Warning: This AIA MasterSpec based document is protected by U.S. Copyright Law and International Treaties. A valid, current MasterSpec license is required for editing or use of this document.

Owner, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.

d. The bidder or proposer agrees to comply with the requirements of 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C while this offer is valid and throughout the period of any contract that may arise from this offer. The bidder or proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.

7. **Byrd Anti-Lobbying Amendment**, 31 U.S.C. § 1352 (as amended)

a. Contractors who apply or bid for an award of $100,000 or more shall file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, officer or employee of Congress, or an employee of a Member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. § 1352. Each tier shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the recipient who in turn will forward the certification(s) to the awarding agency.

b. See Appendix at the end of this Document for Certification Regarding Lobbying. This Certification must accompany any Contract associated with this Project.

8. Procurement of Recovered Materials / Solid Waste Disposal Act

a. In the performance of this contract, the Contractor shall make maximum use of products containing recovered materials that are EPA-designated items unless the product cannot be acquired,

1) Competitively within a timeframe providing for compliance with the contract performance schedule;
2) Meeting contract performance requirements; or
3) At a reasonable price.

b. Information about this requirement, along with the list of EPA designated items, is available at EPA's Comprehensive Procurement Guidelines web site, https://www.epa.gov/smm/comprehensiveprocurement-guideline-cpg-program.

c. The Contractor also agrees to comply with all other applicable requirements of Section 6002 of the "Solid Waste Disposal Act."

ADDITIONAL FEMA REQUIREMENTS

9. Access to Records

a. The following access to records requirements apply to this contract:

1) The Contractor agrees to provide Florida Division of Emergency Management, the Owner, the FEMA Administrator, the Comptroller

Copyright © 2024 by the American Institute of Architects. Warning: This AIA MasterSpec based document is protected by U.S. Copyright Law and International Treaties. A valid, current MasterSpec license is required for editing or use of this document.

General of the United States, or any of their authorized representatives access to any books, documents, papers, and records of the Contractor which are directly pertinent to this contract for the purposes of making audits, examinations, excerpts, and transcriptions.

2) The Contractor agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.
3) The Contractor agrees to provide the FEMA Administrator or his authorized representatives access to construction or other work sites pertaining to the work being completed under the contract.
4) In compliance with the Disaster Recovery Act of 2018, the Florida Division of Emergency Management and the Contractor acknowledge and agree that no language in this contract is intended to prohibit audits or internal reviews by the FEMA Administrator or the Comptroller General of the United States.

10. Changes in the Work

a. To be eligible for FEMA assistance under the non-Federal entity's FEMA grant or cooperative agreement, the cost of the change, modification, change order, or constructive change must be allowable, allocable, within the scope of its grant or cooperative agreement, and reasonable for the completion of project scope. The Construction Contract applicable to this project contains provisions describing how, if at all, changes can be made by either party to alter the method, price, or schedule of the Work without breaching the Contract. In addition to the requirements stated in the Contract underling this Addendum, Contractor shall provide written documentation in connection with any Change in the Work (i.e. Change Order, Request for Use of Contingency or other modification) that the change is: (1) within the scope of the Owner or another federal agency's funding, (2) is reasonable under the circumstances and (3) will provide cost documentation of all requested changes, including any markup for overhead and profit as a separate element of the price.

11. Contracting with Small Businesses, Minority Businesses, Women's Business Enterprises, Veteran-Owned Businesses, and Labor Surplus Area Firms

a. If any subcontracts are to be let by the Contractor, Contractor should, when possible, ensure that small businesses, minority businesses, women's business enterprises, veteran-owned businesses, and labor surplus area firms (See U.S. Department of Labor's list) are considered as set forth below. Such consideration means:

1) These business types are included on solicitation lists;
2) These business types are solicited whenever they are deemed eligible as potential sources;
3) Dividing procurement transactions into separate procurements to permit maximum participation by these business types;
4) Establishing delivery schedules (for example, the percentage of an order to

Copyright © 2024 by the American Institute of Architects. Warning: This AIA MasterSpec based document is protected by U.S. Copyright Law and International Treaties. A valid, current MasterSpec license is required for editing or use of this document.

be delivered by a given date of each month) that encourage participation by these business types; and

5) Utilizing organizations such as the Small Business Administration and the Minority Business Development Agency of the Department of Commerce.

12. Use of DHS Seal, Logo, and Flags

a. The contractor shall not use the DHS seal(s), logos, crests, or reproductions of flags or likenesses of DHS agency officials without specific FEMA pre-approval.

13. Compliance with Federal Law, Regulations, and Executive Orders

a. This is an acknowledgement that FEMA financial assistance will be used to fund all or a portion of the contract. The contractor will comply with all applicable Federal law, regulations, executive orders, FEMA policies, procedures, and directives.

14. No Obligation by Federal Government

a. The Federal Government is not a party to this contract and is not subject to any obligations or liabilities to the non-Federal entity, contractor, or any other party pertaining to any matter resulting from the contract.

15. Program Fraud and False or Fraudulent Statements or Related Acts

a. The Contractor acknowledges that 31 U.S.C. Chap. 38 (Administrative Remedies for False Claims and Statements) applies to the Contractor's actions pertaining to this contract.

16. Domestic Preferences for Procurements

a. The Contractor should, to the greatest extent practicable and consistent with law, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States (including but not limited to iron, aluminum, steel, cement, and other manufactured products). The requirements of this section must be included in all subawards, contracts, and purchase orders under Federal awards.

b. For purposes of this section:

1) "Produced in the United States" means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States.

2) "Manufactured products" means items and construction materials composed in whole or in part of non-ferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber.

Copyright © 2024 by the American Institute of Architects. Warning: This AIA MasterSpec based document is protected by U.S. Copyright Law and International Treaties. A valid, current MasterSpec license is required for editing or use of this document.

1.2 SUPPLEMENTARY CONTRACT PROVISIONS REQUIRED BY STATE OF FLORIDA, DIVISION OF EMERGENCY MANAGEMENT (FDEM)

A. INTRODUCTION

1. The State of Florida, Division of Emergency Management, serves as the pass-through entity for the Federal public assistance funding provided by FEMA under the Public Assistance program with which this Project is, or expects to be, funded. Thus, the Owner is required to comply with applicable Florida Statutes including 215.971. Additionally, all contracts must conform to the uniform standards for procurement found in Florida Statutes 287.057 and 288.703 in addition to the Federal Procurement Provisions listed above.
2. In addition to those listed above, the following Contract provisions are required to be included in all contracts in connection with the Project when the Project will be funded, in whole or in part, with Federal FEMA funds. These provisions are hereby incorporated in any Contract in connection with the Project between the Owner and any of the following: any Prime Contractor and any Construction or Material Suppliers (all of which are referred herein as "Contractor" and/or "Contracting Party") contracted directly by the Owner ("Underlying Agreements"). In addition, these parties in privity with the Owner shall include these provisions (as required below) in any subcontracts entered into in connection with the Project; as well as a clause requiring the subcontractors to include these clauses in any lower tier subcontracts related to the Project. The Prime Contractor shall be responsible for the compliance by any subcontractor or lower-tier subcontractor with all these contract clauses.
3. These Contract provisions shall supplement, modify, amend, and/or replace provisions in the Underlying Agreements, as applicable, and control to the extent of any conflict with the standard provisions of the Underlying Agreements, including any General Conditions applicable thereto, unless the provisions of the Underlying Agreements require a more stringent standard. Where a portion of the Underlying Agreements is not supplemented, modified, amended, and/or deleted by these provisions, such unaltered portions of the Underlying Agreements shall remain in effect.

B. DISCLOSURES AND CERTIFICATIONS

1. Contractor acknowledges that The State of Florida, Division of Emergency Management, serves as the pass-through entity for the Federal public assistance funding provided by FEMA under the Public Assistance program with which this Project is, or expects to be, funded. Contractor warrants and certifies that it will abide by all applicable State of Florida laws, rules, and regulations, executive orders, OMB circulars, policies, procedures and directives applicable to the Contract, terms and conditions of the Owner's FEMA Grant, including but not limited to the following:

    a. Convicted Vendor List: Any person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid for a contract to provide any goods or services to a public entity, may not submit a bid for a contact to a public entity for the construction or repair of a public building or public work, may not submit bids for leases of real property to a public entity, may not be awarded a contract or perform work as a contractor,

Copyright © 2024 by the American Institute of Architects. Warning: This AIA MasterSpec based document is protected by U.S. Copyright Law and International Treaties. A valid, current MasterSpec license is required for editing or use of this document.

supplier, subcontractor, or consultant under a contract with a public entity, and may not transact business with any public entity in excess of the threshold amount provided in Section 287.017, for Category Two for a period of 36 months from the date of being placed on the convicted vendor list.

b. Certification Regarding Debarment and Suspension:

1) Federal regulations prohibit Federal funds from being provided to entities or individuals that are suspended, debarred, or otherwise excluded or ineligible for participation in federal assistance programs. To ensure compliance with federal regulations governing the use of these funds, any entity (including individuals, firms, and other organizations) bidding or contracting on this Project shall certify, to the best of its knowledge, that it and its principles:

a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by a Federal department or agency;
b) Have not, within a five-year period preceding this proposal, been convicted of or had a civil judgment rendered against them for fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or Local) transaction or contract under public transaction; violation of Federal 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 or otherwise criminally or civilly charged by a governmental entity (Federal, State, or Local) with commission of any offenses enumerated in the above paragraph; and,
d) Have not, within a fire-year period preceding this Agreement, had one or more public transactions (Federal, State, or Local) terminated for cause or default.

2) Additionally, any entity bidding or contracting on this Project shall provide their Unique Entity ID Number obtained at SAM.gov.

c. E-Verify: As required by the State of Florida, any Contractor or Subcontractor contracted for this Project shall be registered with and use the E-Verify system to verify the work authorization status of all employees hired on or after July 1, 2023. The Contractor and all subcontractors must provide documentation that they are registered on the Department of Homeland Security's E-Verify System that can be found at htts://www.e-verify.gov.

d. Prohibition against contracting with scrutinized companies (Florida Statute 287.135 (5): By submitting a Bid for this Project, the Contractor certifies that the company is not on the Scrutinized Companies with activities in Sudan List or the Scrutinized Companies with Activities in Iran Terrorism Sectors List and that it does not have business operations in Cuba or Syria. Additionally, by submitting a

Copyright © 2024 by the American Institute of Architects. Warning: This AIA MasterSpec based document is protected by U.S. Copyright Law and International Treaties. A valid, current MasterSpec license is required for editing or use of this document.

Bid for this Project, the Contractor certifies that the company is not participating in a boycott of Israel.

e. Lobbying Prohibited: Per Florida Statute 216.347, funds provided under any contract for this Project may not be used "for the purpose of lobbying the Legislature, the judicial branch, or a state agency." As such, by submitting a Bid for the Project, the Contractor certifies that, to the best of his or her knowledge and belief:

1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the Contrtactor, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, and officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of an Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment or modification of any federal contract, grant, loan, or cooperative agreement.
2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, and officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the Contractor shall complete and submit Standard Form-LLL "Disclosure of Lobbying Activities," in accordance with its instructions.
3) The Contractor shall require that this certification be included in the contract documents for all subcontractors at all tiers and that all Subcontractors shall certify and disclose accordingly.
4) This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each failure.

f. Certification Regarding Debarment, Suspension, Ineligibility, and Voluntary Exclusion (44 C.F.R. Sections 7 and 16, 44 C.F.R. Section 206.11 and 44 C.F.R Section 17):

1) Contractors shall submit with their Bid the Certification Regarding Debarment, Suspension, Ineligibility, and Voluntary Exclusion found at the end of this Section as Attachment B.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF DOCUMENT 007400

Copyright © 2024 by the American Institute of Architects. Warning: This AIA MasterSpec based document is protected by U.S. Copyright Law and International Treaties. A valid, current MasterSpec license is required for editing or use of this document.

APPENDIX A, 44 C.F.R. PART 18 – CERTIFICATION REGARDING LOBBYING

Certification for Contracts, Grants, Loans, and Cooperative Agreements

The undersigned certifies, to the best of his or her knowledge and belief, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

The Contractor,_____ , certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. Chap. 38, Administrative Remedies for False Claims and Statements, apply to this certification and disclosure, if any.

_____
Signature of Contractor's Authorized Official

_____
Name and Title of Contractor's Authorized Official

_____
Date

Copyright © 2024 by the American Institute of Architects. Warning: This AIA MasterSpec based document is protected by U.S. Copyright Law and International Treaties. A valid, current MasterSpec license is required for editing or use of this document.

APPENDIX B
CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY, AND VOLUNTARY EXCLUSION

With respect to any Contractor which receives funds associated with this project funded by the federal government, to the best of its knowledge and believe, that it and its principals:

1. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
2. Have not within the five-year period preceding entering into this Agreement had one or more public transactions (Federal, State, or Local) terminated for cause or default; and
3. Have not within the fire-year prior preceding entering into this proposal been convicted of or had a civil judgement rendered against them for:
    a. The commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or Local) transaction or a contract under public transaction, or
    b. 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.

The Contractor understands and agrees that the language of this certification must be included in the contract documents for all subcontracts at all tiers and that all subcontractors must certify and disclose accordingly.

The Contractor further understands and agrees that this certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into.

The Contractor further understands that submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C Section 1352. Any person who fails to file the required certification is subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

_____
Signature of Contractor's Authorized Official

_____
Name and Title of Contractor's Authorized Official

_____
Street Address

_____
City, State, Zip

_____
Date

Copyright © 2024 by the American Institute of Architects. Warning: This AIA MasterSpec based document is protected by U.S. Copyright Law and International Treaties. A valid, current MasterSpec license is required for editing or use of this document.

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Work performed by Owner.
4. Owner-furnished/Contractor-installed (OFCI) products.
5. Owner-furnished/Owner-installed (OFOI) products.
6. Contractor's use of site and premises.
7. Coordination with occupants.
8. Work restrictions.
9. Specification and Drawing conventions.
10. Miscellaneous provisions.

B. Related Requirements:

1. Section 015000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.
2. Section 017300 "Execution" for coordination of Owner-installed products.

1.2 DEFINITIONS

A. Work Package: A group of specifications, drawings, and schedules prepared by the design team to describe a portion of the Project Work for pricing, permitting, and construction.

1.3 PROJECT INFORMATION

A. Project Identification: Church Building Renovation and Addition.

1. Project Location: 4400 W. 19th Street, Panama City, FL 32405.

B. Owner: Trinity United Methodist Church.

1. Owner's Representative: Rev. Chris Ackerman, Pastor.

C. Architect: Jennifer P. Jones, Architect, LLC.

1. Architect's Representative: Jennifer P. Jones, RA; jennifer@jpjarchitect.com; 251-210-2362.

D. Architect's Consultants: Architect has retained the following design professionals, who have prepared designated portions of the Contract Documents:

1. Civil Engineer: Anchor CEI, Inc..

a. Civil Engineer Representative: Brittany Trumbull, PE; 850-215-1285.

2. Structural Engineer: Barnett Jones Wilson, LLC

a. Structural Engineer Representative: John C. Jones, PE, SE; 205-884-5334

3. MEP Engineer: Watford Engineering, Inc.

a. MEP Engineer Representative: Keith Johnson, PE; 850-526-3447

1.4 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and includes, but is not limited to, the following:

1. The project consists of the renovation of an existing +/- 3,858 SF building and the construction of a +/- 3,201 SF addition on the Trinity United Methodist Church Campus at 4400 W. 19th Street, Panama City, FL 32405. The addition will be a single-story, slab-on-grade and CMU structure with brick veneer, wood roof trusses, asphalt shingle roofing, and associated electrical, mechanical, and plumbing systems. Exterior improvements include a stormwater pond, drives, parking, sidewalks, ramps, fencing, irrigation, landscaping and other Work indicated in the Contract Documents.

B. Type of Contract:

1. Project will be constructed under a single prime contract.

1.5 WORK PERFORMED BY OWNER

A. Cooperate fully with Owner, so work may be carried out smoothly, without interfering with or delaying Work under this Contract or work by Owner. Coordinate the Work of this Contract with work performed by Owner.

B. Preceding Work: Owner will perform the following construction operations at Project site. Those operations are scheduled to be substantially complete before Work under this Contract begins.

1. Owner will salvage existing toilets, select existing vanities and sinks, select interior mirrors, select interior doors, select interior windows, and select interior light fixtures prior to construction activity..
2. Owner will remove movable furnishings from renovation area prior to construction activity.

1.6 OWNER-FURNISHED/CONTRACTOR-INSTALLED (OFCI) PRODUCTS

A. Owner's Responsibilities: Owner will furnish products indicated and perform the following, as applicable:

1. Provide to Contractor Owner-reviewed Product Data, Shop Drawings, and Samples.
2. Provide for delivery of Owner-furnished products to Project site.
3. Upon delivery, inspect, with Contractor present, delivered items.

a. If Owner-furnished products are damaged, defective, or missing, arrange for replacement.

4. Obtain manufacturer's inspections, service, and warranties.
5. Inform Contractor of earliest available delivery date for Owner-furnished products.

B. Contractor's Responsibilities: The Work includes the following, as applicable:

1. Designate delivery dates of Owner-furnished products in Contractor's construction schedule, utilizing Owner-furnished earliest available delivery dates.
2. Review Owner-reviewed Product Data, Shop Drawings, and Samples, noting discrepancies and other issues in providing for Owner-furnished products in the Work.
3. Receive, unload, handle, store, protect, and install Owner-furnished products.
4. Make building services connections for Owner-furnished products.
5. Protect Owner-furnished products from damage during storage, handling, and installation and prior to Substantial Completion.
6. Repair or replace Owner-furnished products damaged following receipt.

C. Owner-Furnished/Contractor-Installed (OFCI) Products:

1. Restroom mirrors, restroom paper towel holders, stacked washer/dryer.

1.7 OWNER-FURNISHED/OWNER-INSTALLED (OFOI) PRODUCTS

A. The Owner will furnish and install products indicated.

B. Owner-Furnished/Owner-Installed (OFOI) Products:

1. 1.5 hp pump at existing well for irrigation.

1.8 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 areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.

1. 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.

C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

D. Condition of Existing Grounds: Maintain portions of existing grounds, landscaping, and hardscaping affected by construction operations throughout construction period. Repair damage caused by construction operations.

1.9 COORDINATION WITH OCCUPANTS

A. Partial Owner Occupancy: Owner will occupy the premises during entire construction period, with the exception of areas under construction. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations. Maintain existing exits unless otherwise indicated.

1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.
2. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.

1.10 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.

B. On-Site Work Hours: Limit work to between 7:00 a.m. to 6:00 p.m., Monday through Friday, unless otherwise indicated. Work hours may be modified to meet Project requirements if approved by Owner and authorities having jurisdiction.

1. Weekend Hours: 8:00 am to 5:00 pm.
2. Hours for Utility Shutdowns: Utilities must be operational on Sunday mornings. Saturday or Weekday utility shutdowns must be coordinated with the Owner at least 48 hours in advance..
3. Hours for Noisy Activity: Weekdays between 9:00 am and 5:00 pm.

C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging for temporary utility services according to requirements indicated:

1. Notify Owner not less than two days in advance of proposed utility interruptions.
2. Obtain Owner's written permission before proceeding with utility interruptions.

D. Noise, Vibration, Dust, and Odors: Coordinate operations that may result in high levels of noise and vibration, dust, odors, or other disruption to Owner occupancy with Owner.

1. Notify Owner not less than two days in advance of proposed disruptive operations.
2. Obtain Owner's written permission before proceeding with disruptive operations.

E. Smoking and Controlled Substance Restrictions: Use of tobacco products , alcoholic beverages, and other controlled substances on Owner's property is not permitted.

F. Employee Identification: Provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.

1.11 SPECIFICATION AND DRAWING CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
2. 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.
4. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

B. Division 00 Contracting Requirements: General provisions of the Contract, including General and Supplementary Conditions, apply to all Sections of the Specifications.

C. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

D. 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.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 012100 - ALLOWANCES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements governing allowances.

B. Types of allowances include the following:

1. Lump-sum allowances.
2. Unit-cost allowances.
3. Quantity allowances.
4. Contingency allowances.

C. Related Requirements:

1. Section 012600 "Contract Modification Procedures" for procedures for submitting and handling Change Orders.
2. Section 014000 "Quality Requirements" for procedures governing the use of allowances for field testing by an independent testing agency.

1.2 DEFINITIONS

A. Allowance: A quantity of work or dollar amount included in the Contract, established in lieu of additional requirements, used to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.

1.3 SELECTION AND PURCHASE

A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection, or purchase and delivery, of each product or system described by an allowance must be completed by the Owner to avoid delaying the Work.

B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

C. Purchase products and systems selected by Architect from the designated supplier.

1.4 ACTION SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances in the form specified for Change Orders.

1.5 INFORMATIONAL SUBMITTALS

A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.

C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.6 LUMP-SUM ALLOWANCES

A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight , and delivery to Project site.

B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner or selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.

C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.

1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.7 UNIT-COST ALLOWANCES

A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include freight , and delivery to Project site.

B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner or selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.

C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.

1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.8 QUANTITY ALLOWANCES

A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight , and delivery to Project site.

B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner or selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.

C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.

1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.9 CONTINGENCY ALLOWANCES

A. Use the contingency allowance only as directed by Architect for Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.

B. Contractor's overhead, profit, and related costs for products and equipment ordered by Owner under the contingency allowance are included in the allowance and are not part of the Contract Sum. These costs include delivery, installation , taxes , insurance, equipment rental, and similar costs.

C. Change Orders authorizing use of funds from the contingency allowance will include Contractor's related costs and reasonable overhead and profit.

D. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

1.10 ADJUSTMENT OF ALLOWANCES

A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, required maintenance materials, and similar margins.

1. Include installation costs in purchase amount only where indicated as part of the allowance.
2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other markups.

B. Submit claims for increased costs due to a change in the scope or nature of the allowance

described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit.

1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of Work has changed from what could have been foreseen from information in the Contract Documents.
2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

A. Allowance No. 1: Contingency Allowance: Include the sum of $30,000.

1. This allowance includes material cost, receiving, handling, and installation, and Contractor overhead and profit.

B. Allowance No. 2: Lump-Sum Allowance: Include the sum of $1,000 for Chandelier in Living Room at front entry.

1. This allowance includes material cost, receiving, handling, installation, and Contractor overhead and profit.
2. Coordinate Lump-sum Allowance with corresponding Alternate in Section 012300 "Alternates."

C. Allowance No. 3: Lump-Sum Allowance: Include the sum of $1,000 for Chandelier in Dining Room.

1. This allowance includes material cost, receiving, handling, installation, and Contractor overhead and profit.
2. Coordinate Lump-sum Allowance with corresponding Alternate in Section 012300 "Alternates."

D. Allowance No. 4: Lump-Sum Allowance: Includes the sum of $900 for Pendant Lighting fixture(s) over the Serving Island.

1. This allowance includes material cost, receiving, handling, installation, and Contractor overhead and profit.
2. Coordinate Lump-sum Allowance with corresponding Alternate in Section 012300 "Alternates."

E. Allowance No. 5: Lump-Sum Allowance: Include the sum of $1,200 for Pendant Lighting fixture(s) over the Waffle-Making Counter.

1. This allowance includes material cost, receiving, handling, installation, and Contractor overhead and profit.
2. Coordinate Lump-sum Allowance with corresponding Alternate in Section 012300 "Alternates."

F. Allowance No. 6: Lump-Sum Allowance: Include the sum of $1,200 for four vanity sconce light fixtures for use in the four restrooms.

1. This allowance includes material cost, receiving, handling, installation, and Contractor overhead and profit.

G. Allowance No. 7: Unit-Cost Brick Allowance: Include the sum of $500 per thousand buff-colored face brick, to be selected by the Architect, and as specified in Section 042000 "Unit Masonry" and shown on the drawings.

1. This allowance includes material cost only. All other costs shall be included in the Contractor's base bid.

H. Allowance No. 8: Unit-Cost Wall and Floor Tile Allowance: Include the sum of $3.00 per square foot of Porcelain or Ceramic Tile, to be selected by Architect, and as specified in Section 093013 "Ceramic Tiling" and shown on the drawings.

1. This allowance includes material cost only. This allowance does not include thinset, grout, transition strips, or other accessories. All other costs shall be included in the Contractor's base bid.

I. Allowance No. 9: Unit-Cost LVP Flooring Allowance: Include the sum of $3.00 per square foot of LVP Flooring, to be selected by Architect, and as specified in Section 096519 Resilient Tile Flooring.

1. This allowance includes material cost only. This allowance does not include floor leveler, adhesive, transition strips, or other accessories. See Unit-Cost Allowance for floor leveler. All other costs shall be included in the Contractor's base bid.

J. Allowance No. 10: Unit-Cost Floor Leveler Allowance at Renovation Area: Include the sum of $1.50 per square foot of floor leveler throughout renovation area, as specified in Section 035416 “Hydraulic Cement Underlayment” and referenced in Section 096519 "Resilient Tile Flooring."

1. This allowance includes material cost only. All other costs shall be included in the Contractor's base bid.

K. Allowance No. 11: Unit-Cost Quartz Agglomerate/Granite Countertop Allowance: Include the sum of $32 per square foot of Quartz Agglomerate or Granite Countertop to be selected by Architect.

1. This allowance includes material cost only. All other costs shall be included in the Contractor's base bid.

L. Allowance No. 12: Unit-Cost Cabinet Pulls Allowance: Include the sum of $20 per cabinet pull, to be selected by Architect.

1. This allowance includes material cost only. All other costs shall be included in the Contractor's base bid.

END OF SECTION 012100

SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for alternates.

1.2 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if the Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternates into the Work. No other adjustments are made to the Contract Sum.

1.3 PROCEDURES

A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.

1. Include, as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation, whether or not indicated as part of alternate.

B. Execute accepted alternates under the same conditions as other Work of the Contract.

C. Schedule: A Part 3 "Schedule of Alternates" Article is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. Alternate No. 1: Allowances for decorative chandeliers and pendant light fixtures

1. Base Bid: Provide junction box, wiring, and blocking in ceiling for future installation of decorative light fixtures.
2. Alternate: Include Lump-Sum Allowances for Chandelier in Living Room at front entry, Chandelier in Dining Room, Pendant Lighting fixture(s) over Serving Island, and Pendant Light fixture(s) over the Waffle-Making Counter. See Reflected Ceiling Plan for count and locations. See Section 012100 "Allowances" for lump-sum allowance amounts.

B. Alternate No. 2: Faux beams at lower vaulted ceiling of Living and Dining Rooms

1. Base Bid: Patch, retexture, and paint GWB at scissor truss (lower vault) ceiling in Living and Dining Rooms as indicated in the Drawings.
2. Alternate: In addition to patching, retexturing, and painting existing GWB ceiling, provide faux beams at lower vaulted ceiling of Living and Dining Rooms. Construct faux beams of finish-grade 1x wood trim, stained. Provide blocking between trusses to securely attach faux beams. See Reflected Ceiling Plan for size, number, and location.

C. Alternate No. 3: T&G Ceiling at Kitchen

1. Base Bid: Provide GWB ceiling at vaulted framing over Serving Island in Warming Kitchen as indicated in the Drawings.
2. Alternate: In lieu of GWB, provide stained T&G Ceiling at vaulted framing over Serving Island in Warming Kitchen.

D. Alternate No. 4: T&G Ceiling at Chapel / Meeting Room

1. Base Bid: Provide GWB ceiling at vaulted framing in Chapel / Meeting Room as indicated in the Drawings.
2. Alternate: In lieu of GWB, provide stained T&G ceiling at vaulted framing in Chapel / Meeting Room.

E. Alternate No. 5: Stamped & Stained Concrete at Patio

1. Base Bid: Broom-finish concrete slab at Patio as indicated in Drawings.
2. Alternate: Stamped and Stained Concrete Patio. Stain color to be selected by Architect from manufacturer's full range. Stamp to be stone paver pattern.

F. Alternate No. 6: Enclosure for future Outdoor Kitchen

1. Base Bid: Continue low brick and precast wall in area indicated for Outdoor Kitchen.
2. Alternate: Provide tall brick and precast wall as indicated in Drawings. Provide stained wood posts, roof framing, roof covering, and fascia to match building addition. See plans for dimensions. Provide painted fiber cement ceiling with battens at seams. Provide ceiling fan with light kit flush-mounted to ceiling and centered.

G. Alternate No. 7: Prayer Garden

1. Base Bid: Provide turf grass in area indicated on Drawings for Prayer Garden. See Landscape Plan for turf grass selection.
2. Alternate: Provide 6x6 wood posts, in locations indicated on Drawings, secured in the

ground with concrete and standing 6 feet tall. Provide steel cables running horizontally between posts and spaced 12" vertically from 24" above grade to 5 feet above grade. Provide climbing plantings at base of trellis "wall." Plantings to be selected by Architect. Cover ground area within Prayer Garden with pea gravel and imbed large stone pavers at stepping stone distances along one side.

H. Alternate No. 8: Upgraded Generator Inlet Box with camlock connectors

1. Base Bid: Manual Transfer Switch and Generator Inlet Box with lug connectors suitable for the connection of a rental generator by a licensed electrician. The rental generator is to be supplied by the Owner as needed.
2. Alternate: In lieu of Generator Inlet Box with lug connectors, provide a Generator Inlet Box with camlock connectors suitable for the connection of a rental generator without the services of a licensed electrician as indicated in Electrical Drawings and specified in Section 16612 "Generator Set."

I. Alternate No. 9: Generator

1. Base Bid: Manual Transfer Switch and Generator Inlet Box with lug connectors suitable for the connection of a rental generator by a licensed electrician. The rental generator is to be supplied by the Owner as needed.
2. Alternate: In lieu of Generator Inlet Box with lug connectors and in lieu of Alternate No. 8 for Generator Inlet Box with camlock connectors, provide 75 kw single phase 120/240-volt permanent generator powered by natural gas as indicated in Electrical Drawings and specified in Section 16612 "Generator Set." The Alternates will be awarded in order as funding allows. Therefore, the price for this alternate should be the change in price from the work described in Alternate No. 8.

END OF SECTION 012300

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

B. Related Requirements:

1. Document 002600 "Procurement Substitution Procedures" for requirements for substitution requests prior to award of Contract.
2. Section 012100 "Allowances" for products selected under an allowance.
3. Section 012300 "Alternates" for products selected under an alternate.

1.2 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents.

1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required to meet other Project requirements but may offer advantage to Contractor or Owner.

1.3 ACTION SUBMITTALS

A. Substitution Requests: Submit documentation identifying product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Substitution Request Form: Use form acceptable to Architect.
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.
b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
c. Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size,

durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.

d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
e. Samples, where applicable or requested.
f. Certificates and qualification data, where applicable or requested.
g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.
h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
i. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
j. Cost information, including a proposal of change, if any, in the Contract Sum.
k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

    a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.

1.4 PROCEDURES

A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

1.5 SUBSTITUTIONS

A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.

    1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect

will return requests without action, except to record noncompliance with these requirements:

a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
b. Substitution request is fully documented and properly submitted.
c. Requested substitution will not adversely affect Contractor's construction schedule.
d. Requested substitution has received necessary approvals of authorities having jurisdiction.
e. Requested substitution is compatible with other portions of the Work.
f. Requested substitution has been coordinated with other portions of the Work.
g. Requested substitution provides specified warranty.

B. Substitutions for Convenience:

1. Not allowed unless otherwise indicated.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

B. Related Requirements:

1. Section 012500 "Substitution Procedures" for administrative procedures for handling requests for substitutions made after the Contract award.
2. Section 013100 "Project Management and Coordination" for requirements for forms for contract modifications provided as part of web-based Project management software.

1.2 MINOR CHANGES IN THE WORK

A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on form included in Project Manual.

1.3 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
2. Within 14 days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
c. Include costs of labor and supervision directly attributable to the change.
d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

e. Quotation Form: Use forms acceptable to Architect.

B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include costs of labor and supervision directly attributable to the change.
5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
6. Comply with requirements in Section 012500 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
7. Proposal Request Form: Use form acceptable to Architect.

1.4 ADMINISTRATIVE CHANGE ORDERS

A. Allowance Adjustment: See Section 012100 "Allowances" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect actual costs of allowances.

B. Unit-Price Adjustment: See Section 012200 "Unit Prices" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect measured scope of unit-price work.

1.5 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Work Change Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on form included in Project Manual.

1.6 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: Architect may issue a Construction Change Directive on form included in Project Manual. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.

B. Related Requirements:

1. Document 004373 "Proposed Schedule of Values Form" for requirements for furnishing proposed schedule of values with bid.
2. Section 012100 "Allowances" for procedural requirements governing the handling and processing of allowances.
3. Section 012200 "Unit Prices" for administrative requirements governing the use of unit prices.
4. Section 012600 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
5. Section 013200 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

1.2 DEFINITIONS

A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.3 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.

1. Coordinate line items in the schedule of values with items required to be indicated as separate activities in Contractor's construction schedule.
2. Submit the schedule of values to Architect at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.

B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.

1. Identification: Include the following Project identification on the schedule of values:

a. Project name and location.

b. Owner's name.
c. Owner's Project number.
d. Name of Architect.
e. Architect's Project number.
f. Contractor's name and address.
g. Date of submittal.

2. Arrange schedule of values consistent with format of AIA Document G703.
3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
4. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.

    a. Differentiate between items stored on-site and items stored off-site.

5. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
6. Overhead Costs, Proportional Distribution: Include total cost and proportionate share of general overhead and profit for each line item.
7. Temporary Facilities: Show cost of temporary facilities and other major cost items that are not direct cost of actual work-in-place as separate line items.
8. Schedule of Values Revisions: Revise the schedule of values when Change Orders or Construction Change Directives result in a change in the Contract Sum. Include at least one separate line item for each Change Order and Construction Change Directive.

1.4 APPLICATIONS FOR PAYMENT

A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments, as certified by Architect and paid for by Owner.

B. Payment Application Times: Submit Application for Payment to Architect by the last day of the month. The period covered by each Application for Payment is one month, ending on the last day of the month.

C. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.

    1. Other Application for Payment forms proposed by the Contractor may be acceptable to Architect and Owner. Submit forms for approval with initial submittal of schedule of values.

D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.

1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

E. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.

1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment for stored materials.
2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
3. Provide summary documentation for stored materials indicating the following:

    a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
    b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
    c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.

F. Transmittal: Submit PDF of signed and notarized original copies of each Application for Payment to Architect by email . PDF shall include waivers of lien and similar attachments if required.

G. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.

1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
2. When an application shows completion of an item, submit conditional final or full waivers.
3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
4. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.

H. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

1. List of subcontractors. (Due within 24 hours of Bid Opening from apparent low bidder.)

2. Schedule of values.
3. Contractor's construction schedule (preliminary if not final).
4. Schedule of unit prices.
5. Submittal schedule (preliminary if not final).
6. List of Contractor's staff assignments.
7. Copies of building permits.
8. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
9. Certificates of insurance and insurance policies.
10. Performance and payment bonds.

I. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.

1. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

J. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
2. Certification of completion of final punch list items.
3. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
4. Updated final statement, accounting for final changes to the Contract Sum.
5. AIA Document G706.
6. AIA Document G706A.
7. Evidence that claims have been settled.
8. Final liquidated damages settlement statement.
9. Proof that taxes, fees, and similar obligations are paid.
10. Waivers and releases.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project, including, but not limited to, the following:

1. General coordination procedures.
2. Coordination drawings.
3. RFIs.
4. Digital project management procedures.
5. Project meetings.

B. Related Requirements:

1. Section 013200 "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
2. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
3. Section 017700 "Closeout Procedures" for coordinating closeout of the Contract.

1.2 DEFINITIONS

A. RFI: Request for Information. Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.3 INFORMATIONAL SUBMITTALS

A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

1. Name, address, telephone number, and email address of entity performing subcontract or supplying products.
2. Subcontract List is due from apparent low bidder within 24 hours of Bid Opening.

B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses, cellular telephone numbers, and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.

1.4 REQUEST FOR INFORMATION (RFI)

A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.

1. Architect will return without response those RFIs submitted to Architect by other entities controlled by Contractor.
2. Coordinate and submit RFIs in a prompt manner to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

1. Project name.
2. Owner name.
3. Date.
4. Name of Contractor.
5. RFI number, numbered sequentially.
6. RFI subject.
7. Specification Section number and title and related paragraphs, as appropriate.
8. Drawing number and detail references, as appropriate.
9. Field dimensions and conditions, as appropriate.
10. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
11. Contractor's signature.
12. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

    a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

C. RFI Forms: .

1. Attachments shall be electronic files in PDF format.
2. Form shall be any format acceptable to Architect.

D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.

1. The following Contractor-generated RFIs will be returned without action:

    a. Requests for approval of submittals.
    b. Requests for approval of substitutions.
    c. Requests for approval of Contractor's means and methods.
    d. Requests for coordination information already indicated in the Contract Documents.

e. Requests for adjustments in the Contract Time or the Contract Sum.
f. Requests for interpretation of Architect's actions on submittals.
g. Incomplete RFIs or inaccurately prepared RFIs.

2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt by Architect of additional information.
3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."

a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 5 days of receipt of the RFI response.

1.5 DIGITAL PROJECT MANAGEMENT PROCEDURES

A. Use of Architect's Digital Data Files: Digital data files of Architect's BIM model will be provided by Architect for Contractor's use during construction.

1. Digital data files may be used by Contractor in preparing coordination drawings, Shop Drawings, and Project Record Drawings.
2. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Contract Drawings.
3. Digital Drawing Software Program: Contract Drawings are available in Revit or AutoCAD.
4. Contractor shall execute a data licensing agreement in the form of Agreement form acceptable to Owner and Architect.

a. Subcontractors and other parties granted access by Contractor to Architect's digital data files shall execute a data licensing agreement in the form of Agreement acceptable to Owner and Architect.

5. The Architect's Digital Data Files shall remain the property of the Architect and are provided solely for the Contractor's convenience..

1.6 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times a minimum of seven days prior to meeting.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.

B. Preconstruction Conference: Architect will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15

days after execution of the Agreement.

1. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Discuss items of significance that could affect progress, including the following:

    a. Responsibilities and personnel assignments.
    b. Tentative construction schedule.
    c. Critical work sequencing and long lead items.
    d. Designation of key personnel and their duties.
    e. Lines of communications.
    f. Procedures for processing field decisions and Change Orders.
    g. Procedures for RFIs.
    h. Procedures for testing and inspecting.
    i. Procedures for processing Applications for Payment.
    j. Submittal procedures.
    k. Preparation of Record Documents.
    l. Use of the premises and existing building.
    m. Work restrictions.
    n. Working hours.
    o. Owner's occupancy requirements.
    p. Responsibility for temporary facilities and controls.
    q. Procedures for moisture and mold control.
    r. Procedures for disruptions and shutdowns.
    s. Construction waste management and recycling.
    t. Parking availability.
    u. Office, work, and storage areas.
    v. Equipment deliveries and priorities.
    w. Security.
    x. Progress cleaning.

3. Minutes:Architect will record and distribute meeting minutes.

C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity when required by other Sections and when required for coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:

    a. Contract Documents.
    b. Options.

c. Related RFIs.
d. Related Change Orders.
e. Purchases.
f. Deliveries.
g. Submittals.
h. Review of mockups.
i. Possible conflicts.
j. Compatibility requirements.
k. Time schedules.
l. Weather limitations.
m. Manufacturer's written instructions.
n. Warranty requirements.
o. Compatibility of materials.
p. Acceptability of substrates.
q. Temporary facilities and controls.
r. Space and access limitations.
s. Regulations of authorities having jurisdiction.
t. Testing and inspecting requirements.
u. Installation procedures.
v. Coordination with other work.
w. Required performance results.
x. Protection of adjacent work.
y. Protection of construction and personnel.

3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than 30 days prior to the scheduled date of Substantial Completion.

1. Conduct the conference to review requirements and responsibilities related to Project closeout.
2. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:

a. Preparation of Record Documents.
b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.

c. Procedures for completing and archiving web-based Project software site data files.
d. Submittal of written warranties.
e. Requirements for preparing operations and maintenance data.
f. Requirements for delivery of material samples, attic stock, and spare parts.
g. Requirements for demonstration and training.
h. Preparation of Contractor's punch list.
i. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
j. Submittal procedures.
k. Owner's partial occupancy requirements.
l. Installation of Owner's furniture, fixtures, and equipment.
m. Responsibility for removing temporary facilities and controls.

4. Minutes:Architect will record and distribute meeting minutes.

E. Progress Meetings: Conduct progress meetings every two weeks intervals.

1. Attendees: In addition to representatives of Owner, and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

1) Review schedule for next period.

b. Review present and future needs of each entity present, including the following:

1) Interface requirements.
2) Sequence of operations.
3) Status of submittals.
4) Deliveries.
5) Off-site fabrication.
6) Access.
7) Site use.
8) Temporary facilities and controls.
9) Progress cleaning.
10) Quality and work standards.

11) Status of correction of deficient items.
12) Field observations.
13) Status of RFIs.
14) Status of Proposal Requests.
15) Pending changes.
16) Status of Change Orders.
17) Pending claims and disputes.
18) Documentation of information for payment requests.

3. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.

a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting, where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Contractor's Construction Schedule.
2. Daily construction reports.

B. Related Requirements:

1. Section 012900 "Payment Procedures" for schedule of values and requirements for use of cost-loaded schedule for Applications for Payment.
2. Section 014000 "Quality Requirements" for schedule of tests and inspections.

1.2 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction Project. Activities included in a construction schedule consume time and resources.

1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
2. Predecessor Activity: An activity that precedes another activity in the network.
3. Successor Activity: An activity that follows another activity in the network.

B. Cost Loading: The allocation of the schedule of values for completing an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum.

C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine the critical path of Project and when activities can be performed.

D. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

E. Event: The starting or ending point of an activity.

F. Float: The measure of leeway in starting and completing an activity.

1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.

2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

G. Resource Loading: The allocation of labor and equipment necessary for completing an activity as scheduled.

1.3 INFORMATIONAL SUBMITTALS

A. Format for Submittals: Submit required submittals in the following format:

1. PDF file.

B. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.

C. Daily Construction Reports: Submit at monthly intervals.

1.4 COORDINATION

A. Coordinate Contractor's Construction Schedule with the schedule of values, submittal schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from entities involved.
2. Coordinate each construction activity in the network with other activities, and schedule them in proper sequence.

1.5 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Substantial Completion.

1. Contract completion date to not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

B. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.

1. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
2. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Section 011000 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
3. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Section 011000 "Summary." Delivery dates indicated stipulate the

earliest possible delivery date.

4. Work Restrictions: Show the effect of the following items on the schedule:

    a. Coordination with existing construction.
    b. Limitations of continued occupancies.
    c. Uninterruptible services.
    d. Partial occupancy before Substantial Completion.
    e. Use-of-premises restrictions.
    f. Seasonal variations.
    g. Environmental control.

C. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
2. As the Work progresses, indicate Final Completion percentage for each activity.

D. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, equipment required to achieve compliance, and date by which recovery will be accomplished.

E. Distribution: Distribute copies of approved schedule to Architect, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

1.6 GANTT-CHART SCHEDULE REQUIREMENTS

A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal, Gantt-chart-type, Contractor's Construction Schedule within 30 days of date established for the Notice to Proceed.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

1. For construction activities that require three months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

1.7 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:

1. List of subcontractors at Project site.
2. List of separate contractors at Project site.
3. Approximate count of personnel at Project site.
4. Equipment at Project site.
5. Material deliveries.
6. High and low temperatures and general weather conditions, including presence of rain or snow.
7. Testing and inspection.
8. Accidents.
9. Meetings and significant decisions.
10. Unusual events.
11. Stoppages, delays, shortages, and losses.
12. Meter readings and similar recordings.
13. Emergency procedures.
14. Orders and requests of authorities having jurisdiction.
15. Change Orders received and implemented.
16. Construction Change Directives received and implemented.
17. Services connected and disconnected.
18. Equipment or system tests and startups.
19. Partial completions and occupancies.
20. Substantial Completions authorized.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF SECTION 013200

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Submittal schedule requirements.
2. Administrative and procedural requirements for submittals.

B. Related Requirements:

1. Section 012900 "Payment Procedures" for submitting Applications for Payment and the schedule of values.
2. Section 013100 "Project Management and Coordination" for submitting coordination drawings and subcontract list and for requirements for web-based Project software.
3. Section 013200 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
4. Section 014000 "Quality Requirements" for submitting test and inspection reports, and schedule of tests and inspections.
5. Section 017700 "Closeout Procedures" for submitting closeout submittals and maintenance material submittals.
6. Section 017823 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
7. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
8. Section 017900 "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.

1.2 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."

B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

1.3 SUBMITTAL FORMATS

A. Submittal Information: Include the following information in each submittal:

1. Project name.
2. Date.
3. Name of Architect.
4. Name of Contractor.
5. Name of firm or entity that prepared submittal.
6. Names of subcontractor, manufacturer, and supplier.
7. Unique submittal number, including revision identifier. Include Specification Section number with sequential alphanumeric identifier and alphanumeric suffix for resubmittals.
8. Number and title of Specification Section, with paragraph number and generic name for each of multiple items.
9. Drawing number and detail references, as appropriate.
10. Location(s) where product is to be installed, as appropriate.
11. Other necessary identification.
12. Remarks.
13. Signature of transmitter.

B. Options: Identify options requiring selection by Architect.

C. Deviations and Additional Information: On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information and revisions, other than those requested by Architect on previous submittals. Indicate by highlighting on each submittal or noting on attached separate sheet.

D. Electronic Submittals:Except for Submittals requiring color, pattern, or other aesthetic selections, prepare submittals as PDF package, incorporating complete information into each PDF file. Name PDF file with submittal number.

E. Physical Submittals: For Submittals requiring color, pattern, or other aesthetic selections, submit a physical submittal.

1.4 SUBMITTAL PROCEDURES

A. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

1. Email: Prepare submittals as PDF package and transmit to Architect by sending via email. Include PDF transmittal form. Include information in email subject line as requested by Architect.

a. Architect will return annotated file. Annotate and retain one copy of file as a digital Project Record Document file.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other

submittals, and related activities that require sequential activity.

2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
4. Coordinate transmittal of submittals for related parts of the Work specified in different Sections, so processing will not be delayed because of need to review submittals concurrently for coordination.

    a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received. In particular, submittals requiring color, pattern, or other aesthetic selections shall be submitted at the same time.

C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
2. Resubmittal Review: Allow 15 days for review of each resubmittal.
3. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal.

    a. Structural, HVAC, Plumbing, and Electrical Specification Sections require sequential review..

D. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block, and clearly indicate extent of revision.
3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.

E. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

F. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

1.5 SUBMITTAL REQUIREMENTS

A. Product Data: Collect information into a single submittal for each element of construction and

type of product or equipment.

1. If information must be specially prepared for submittal because standard published data are unsuitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

    a. Manufacturer's catalog cuts.
    b. Manufacturer's product specifications.
    c. Standard color charts.
    d. Statement of compliance with specified referenced standards.
    e. Testing by recognized testing agency.
    f. Application of testing agency labels and seals.
    g. Notation of coordination requirements.

4. For equipment, include the following in addition to the above, as applicable:

    a. Wiring diagrams that show factory-installed wiring.
    b. Printed performance curves.
    c. Operational range diagrams.
    d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.

5. Submit Product Data before Shop Drawings, and before or concurrently with Samples.

B. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data .

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

    a. Identification of products.
    b. Schedules.
    c. Compliance with specified standards.
    d. Notation of coordination requirements.
    e. Notation of dimensions established by field measurement.
    f. Relationship and attachment to adjoining construction clearly indicated.
    g. Seal and signature of professional engineer if specified.

C. Samples: Submit Physical Samples for review of type, color, pattern, and texture for a check of these characteristics with other materials.

1. Transmit Samples that contain multiple, related components, such as accessories together in one submittal package.
2. Identification: Permanently attach label on unexposed side of Samples that includes the following:

    a. Project name and submittal number.
    b. Generic description of Sample.

c. Product name and name of manufacturer.
d. Sample source.
e. Number and title of applicable Specification Section.
f. Specification paragraph number and generic name of each item.

3. Paper Transmittal: Include paper transmittal, including complete submittal information indicated.
4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units, showing the full range of colors, textures, and patterns available.

    a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.

6. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

    a. Number of Samples: Submit two sets of Samples. Architect will retain one Sample sets; remainder will be returned.

        1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
        2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

D. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.

E. Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.

F. Certificates:

1. Certificates and Certifications Submittals: Submit a statement that includes signature of

entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity. Provide a notarized signature where indicated.

2. Installer Certificates: Submit written statements on manufacturer's letterhead, certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
3. Manufacturer Certificates: Submit written statements on manufacturer's letterhead, certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
4. Material Certificates: Submit written statements on manufacturer's letterhead, certifying that material complies with requirements in the Contract Documents.
5. Product Certificates: Submit written statements on manufacturer's letterhead, certifying that product complies with requirements in the Contract Documents.
6. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of AWS B2.1/B2.1M on AWS forms. Include names of firms and personnel certified.

G. Test and Research Reports:

1. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for substrate preparation and primers required.
2. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
3. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
4. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
5. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
6. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:

    a. Name of evaluation organization.
    b. Date of evaluation.
    c. Time period when report is in effect.
    d. Product and manufacturers' names.
    e. Description of product.
    f. Test procedures and results.
    g. Limitations of use.

1.6 DELEGATED DESIGN SERVICES

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are insufficient to perform services or certification required, submit a written request for additional information to Architect.

B. Delegated Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF file paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.

1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

1.7 CONTRACTOR'S REVIEW

A. Action Submittals and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect .

B. Contractor's Approval: Indicate Contractor's approval for each submittal with a uniform approval stamp. Include name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

1. Architect will not review submittals received from Contractor that do not have Contractor's review and approval.

1.8 ARCHITECT'S REVIEW

A. Action Submittals: Architect will review each submittal, indicate corrections or revisions required , and return.

1. PDF Submittals: Architect will indicate, via markup on each submittal, the appropriate action .
2. Paper Submittals: Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action .

B. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.

D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

E. Architect will return without review submittals received from sources other than Contractor.

F. Submittals not required by the Contract Documents will be returned by Architect without action.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF SECTION 013300

SECTION 013516 - ALTERATION PROJECT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes special procedures for alteration work.

1.2 DEFINITIONS

A. Alteration Work: This term includes remodeling, renovation, repair, and maintenance work performed within existing spaces or on existing surfaces as part of the Project.

B. Consolidate: To strengthen loose or deteriorated materials in place.

C. Design Reference Sample: A sample that represents the Architect's prebid selection of work to be matched; it may be existing work or work specially produced for the Project.

D. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

E. Match: To blend with adjacent construction and manifest no apparent difference in material type, species, cut, form, detail, color, grain, texture, or finish; as approved by Architect.

F. Refinish: To remove existing finishes to base material and apply new finish to match original, or as otherwise indicated.

G. Repair: To correct damage and defects, retaining existing materials, features, and finishes. This includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials.

H. Replace: To remove, duplicate, and reinstall entire item with new material. The original item is the pattern for creating duplicates unless otherwise indicated.

I. Replicate: To reproduce in exact detail, materials, and finish unless otherwise indicated.

J. Reproduce: To fabricate a new item, accurate in detail to the original, and from either the same or a similar material as the original, unless otherwise indicated.

K. Retain: To keep an element or detail secure and intact.

L. Strip: To remove existing finish down to base material unless otherwise indicated.

1.3 PROJECT MEETINGS FOR ALTERATION WORK

A. Preliminary Conference for Alteration Work: Before starting alteration work, Architect will conduct conference at Project site.

1. Attendees: In addition to representatives of Owner, Architect, and Contractor, testing service representative, specialists, and chemical-cleaner manufacturer(s) shall be represented at the meeting.
2. Agenda: Discuss items of significance that could affect progress of alteration work, including review of the following:

a. Fire-prevention plan.
b. Governing regulations.
c. Areas where existing construction is to remain and the required protection.
d. Hauling routes.
e. Sequence of alteration work operations.
f. Storage, protection, and accounting for salvaged and specially fabricated items.
g. Existing conditions, staging, and structural loading limitations of areas where materials are stored.
h. Requirements for extent and quality of work, tolerances, and required clearances.
i. Embedded work such as flashings and lintels, special details, collection of waste, protection of occupants and the public, and condition of other construction that affects the Work or will affect the work.

3. Reporting: Architect will record conference results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from conference.

1.4 MATERIALS OWNERSHIP

A. Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to Owner that may be encountered or uncovered during the Work, regardless of whether they were previously documented, remain Owner's property.

1. Carefully dismantle and salvage each item or object in a manner to prevent damage and protect it from damage, then promptly deliver it to Owner where directed at Project site.

1.5 INFORMATIONAL SUBMITTALS

A. Preconstruction Documentation: Show preexisting conditions of adjoining construction and site improvements that are to remain, including finish surfaces, that might be misconstrued as damage caused by Contractor's alteration work operations.

1.6 QUALITY ASSURANCE

A. Safety and Health Standard: Comply with ANSI/ASSP A10.6.

1.7 STORAGE AND HANDLING OF SALVAGED MATERIALS

A. Salvaged Materials:

1. Clean loose dirt and debris from salvaged items unless more extensive cleaning is indicated.
2. Pack or crate items after cleaning; cushion against damage during handling. Label contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area on-site.
5. Protect items from damage during transport and storage.

B. Salvaged Materials for Reinstallation:

1. Repair and clean items for reuse as indicated.
2. Pack or crate items after cleaning and repairing; cushion against damage during handling. Label contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment unless otherwise indicated. Provide connections, supports, and miscellaneous materials to make items functional for use indicated.

C. Existing Materials to Remain: Protect construction indicated to remain against damage and soiling from construction work. Where permitted by Architect, items may be dismantled and taken to a suitable, protected storage location during construction work and reinstalled in their original locations after alteration and other construction work in the vicinity is complete.

D. Storage Space:

1. Owner will arrange for limited on-site location(s) for free storage of salvaged material. This storage space does not include security for stored material.
2. Arrange for off-site locations for storage and protection of salvaged material that cannot be stored and protected on-site.

1.8 FIELD CONDITIONS

A. Survey of Existing Conditions: Record existing conditions that affect the Work by use of preconstruction photographs.

B. Discrepancies: Notify Architect of discrepancies between existing conditions and Drawings before proceeding with removal and dismantling work.

C. Owner's Removals: Before beginning alteration work, verify in correspondence with Owner

that the following items have been removed:

1. As indicated on Drawings.

PART 2 - PRODUCTS - (Not Used)
PART 3 - EXECUTION

3.1 PROTECTION

A. Protect persons, motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm resulting from alteration work.

1. Use only proven protection methods, appropriate to each area and surface being protected.
2. Provide temporary barricades, barriers, and directional signage to exclude the public from areas where alteration work is being performed.
3. Erect temporary barriers to form and maintain fire-egress routes.
4. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during alteration work.
5. Contain dust and debris generated by alteration work, and prevent it from reaching the public or adjacent surfaces.
6. Provide shoring, bracing, and supports as necessary. Do not overload structural elements.
7. Protect floors and other surfaces along hauling routes from damage, wear, and staining.
8. Provide supplemental sound-control treatment to isolate demolition work from other areas of the building.

B. Temporary Protection of Materials to Remain:

1. Protect existing materials with temporary protections and construction. Do not remove existing materials unless otherwise indicated.
2. Do not attach temporary protection to existing surfaces except as indicated as part of the alteration work program.

C. Comply with each product manufacturer's written instructions for protections and precautions. Protect against adverse effects of products and procedures on people and adjacent materials, components, and vegetation.

D. Utility and Communications Services:

1. Notify Owner, Architect, authorities having jurisdiction, and entities owning or controlling wires, conduits, pipes, and other services affected by alteration work before commencing operations.
2. Disconnect and cap pipes and services as required by authorities having jurisdiction, as required for alteration work.
3. Maintain existing services unless otherwise indicated; keep in service, and protect against damage during operations. Provide temporary services during interruptions to

existing utilities.

E. Existing Drains: Prior to the start of work in an area, test drainage system to ensure that it is functioning properly. Notify Architect immediately of inadequate drainage or blockage. Do not begin work in an area until the drainage system is functioning properly.

1. Prevent solids such as adhesive or mortar residue or other debris from entering the drainage system. Clean out drains and drain lines that become sluggish or blocked by sand or other materials resulting from alteration work.
2. Protect drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.

3.2 PROTECTION FROM FIRE

A. General: Follow fire-prevention plan and the following:

1. Comply with NFPA 241 requirements unless otherwise indicated. Perform duties titled "Owner's Responsibility for Fire Protection."
2. Remove and keep area free of combustibles, including rubbish, paper, waste, and chemicals, unless necessary for the immediate work.

B. Heat-Generating Equipment and Combustible Materials: Comply with the following procedures while performing work with heat-generating equipment or combustible materials, including welding, torch-cutting, soldering, brazing, removing paint with heat, or other operations where open flames or implements using high heat or combustible solvents and chemicals are anticipated:

1. Obtain Owner's approval for operations involving use of open-flame or welding or other high-heat equipment. Notify Owner at least 72 hours before each occurrence, indicating location of such work.
2. As far as practicable, restrict heat-generating equipment to shop areas or outside the building.
3. Do not perform work with heat-generating equipment in or near rooms or in areas where flammable liquids or explosive vapors are present or thought to be present. Use a combustible gas indicator test to ensure that the area is safe.
4. Use fireproof baffles to prevent flames, sparks, hot gases, or other high-temperature material from reaching surrounding combustible material.
5. Prevent the spread of sparks and particles of hot metal through open windows, doors, holes, and cracks in floors, walls, ceilings, roofs, and other openings.
6. Fire Watch: Before working with heat-generating equipment or combustible materials, station personnel to serve as a fire watch at each location where such work is performed. Fire-watch personnel shall have the authority to enforce fire safety. Station fire watch according to NFPA 51B, NFPA 241, and as follows:

a. Train each fire watch in the proper operation of fire-control equipment and alarms.
b. Prohibit fire-watch personnel from other work that would be a distraction from fire-watch duties.

c. Cease work with heat-generating equipment whenever fire-watch personnel are not present.
d. Have fire-watch personnel perform final fire-safety inspection each day beginning no sooner than 30 minutes after conclusion of work to detect hidden or smoldering fires and to ensure that proper fire prevention is maintained.
e. Maintain fire-watch personnel at Project site until two hours after conclusion of daily work.

C. Fire-Control Devices: Provide and maintain fire extinguishers, fire blankets, and rag buckets for disposal of rags with combustible liquids. Maintain each as suitable for the type of fire risk in each work area. Ensure that nearby personnel and the fire-watch personnel are trained in fire-extinguisher and blanket use.

3.3 PROTECTION DURING APPLICATION OF CHEMICALS

A. Protect motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm or spillage resulting from applications of chemicals and adhesives.

B. Cover adjacent surfaces with protective materials that are proven to resist chemicals selected for Project unless chemicals being used will not damage adjacent surfaces as indicated in alteration work program. Use covering materials and masking agents that are waterproof and UV resistant and that will not stain or leave residue on surfaces to which they are applied. Apply protective materials according to manufacturer's written instructions. Do not apply liquid masking agents or adhesives to painted or porous surfaces. When no longer needed, promptly remove protective materials.

C. Do not apply chemicals during winds of sufficient force to spread them to unprotected surfaces.

D. Neutralize alkaline and acid wastes and legally dispose of off Owner's property.

E. Collect and dispose of runoff from chemical operations by legal means and in a manner that prevents soil contamination, soil erosion, undermining of paving and foundations, damage to landscaping, or water penetration into building interior.

3.4 GENERAL ALTERATION WORK

A. Have specialty work performed only by qualified specialists.

B. Ensure that supervisory personnel are present when work begins and during its progress.

C. Record existing work before each procedure (preconstruction), and record progress during the work. Use digital preconstruction documentation photographs.

D. Perform surveys of Project site as the Work progresses to detect hazards resulting from alterations.

E. Notify Architect of visible changes in the integrity of material or components whether from environmental causes including biological attack, UV degradation, freezing, or thawing or from structural defects including cracks, movement, or distortion.

1. Do not proceed with the work in question until directed by Architect.

END OF SECTION 013516

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspection services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1. Specific quality-assurance and quality-control requirements for individual work results are specified in their respective Specification Sections. Requirements in individual Sections may also cover production of standard products.
2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.
3. Requirements for Contractor to provide quality-assurance and quality-control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

1.2 DEFINITIONS

A. Experienced: When used with an entity or individual, "experienced," unless otherwise further described, means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

B. Field Quality-Control Tests and Inspections: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

C. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, subcontractor, or sub-subcontractor, to perform a particular construction operation, including installation, erection, application, assembly, and similar operations.

1. Use of trade-specific terminology in referring to a Work result does not require that certain construction activities specified apply exclusively to specific trade(s).

D. Mockups: Physical assemblies of portions of the Work constructed to establish the standard by which the Work will be judged. Mockups are not Samples.

1. Mockups are used for one or more of the following:

a. Verify selections made under Sample submittals.

b. Demonstrate aesthetic effects.
c. Demonstrate the qualities of products and workmanship.
d. Demonstrate successful installation of interfaces between components and systems.
e. Perform preconstruction testing to determine system performance.

2. Product Mockups: Mockups that may include multiple products, materials, or systems specified in a single Section.
3. In-Place Mockups: Mockups constructed on-site in their actual final location as part of permanent construction.

E. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria. Unless otherwise indicated, copies of reports of tests or inspections performed for other than the Project do not meet this definition.

F. Product Tests: Tests and inspections that are performed by a nationally recognized testing laboratory (NRTL) in accordance with 29 CFR 1910.7, by a testing agency accredited in accordance with NIST's National Voluntary Laboratory Accreditation Program (NVLAP), or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

G. Source Quality-Control Tests and Inspections: Tests and inspections that are performed at the source (e.g., plant, mill, factory, or shop).

H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. The term "testing laboratory" has the same meaning as the term "testing agency."

I. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work, to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

J. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work, to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Contractor's quality-control services do not include contract administration activities performed by Architect .

1.3 DELEGATED DESIGN SERVICES

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

B. Delegated Design Services Statement: Submit a statement signed and sealed by the responsible design professional, for each product and system specifically assigned to

Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

1.4 CONFLICTING REQUIREMENTS

A. Conflicting Standards and Other Requirements: If compliance with two or more standards or requirements is specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, inform the Architect regarding the conflict and obtain clarification prior to proceeding with the Work. Refer conflicting requirements that are different, but apparently equal, to Architect for clarification before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified is the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.5 INFORMATIONAL SUBMITTALS

A. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility submitted to authorities having jurisdiction before starting work on the following systems:

1. Seismic-force-resisting system, designated seismic system, or component listed in the Statement of Special Inspections.
2. Primary wind-force-resisting system or a wind-resisting component listed in the Statement of Special Inspections.

B. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

C. Schedule of Tests and Inspections: Prepare in tabular form and include the following:

1. Specification Section number and title.
2. Entity responsible for performing tests and inspections.
3. Description of test and inspection.
4. Identification of applicable standards.
5. Identification of test and inspection methods.
6. Number of tests and inspections required.
7. Time schedule or time span for tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

D. Reports: Prepare and submit certified written reports and documents as specified.

E. Permits, Licenses, and Certificates: For Owner's record, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.

1.6 REPORTS AND DOCUMENTS

A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, telephone number, and email address of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample-taking and testing and inspection.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, telephone number, and email address of technical representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement of whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, telephone number, and email address of factory-authorized service

representative making report.
2. Statement that equipment complies with requirements.
3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
4. Statement of whether conditions, products, and installation will affect warranty.
5. Other required items indicated in individual Specification Sections.

1.7 QUALITY ASSURANCE

A. Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.

C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Installer Qualifications: A firm or individual experienced in installing, erecting, applying, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that is similar in material, design, and extent to those indicated for this Project.

F. Specialists: Certain Specification Sections require that specific construction activities be performed by entities who are recognized experts in those operations. Specialists will satisfy qualification requirements indicated and engage in the activities indicated.

1. Requirements of authorities having jurisdiction supersede requirements for specialists.

G. Testing and Inspecting Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented in accordance with ASTM E329, and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.

H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect, demonstrate, repair, and perform service on installations of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:

1. Contractor's Responsibilities:

   a. Provide test specimens representative of proposed products and construction.
   b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
   c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
   d. Build site-assembled test assemblies and mockups, using installers who will perform same tasks for Project.
   e. When testing is complete, remove test specimens and test assemblies , and mockups; do not reuse products on Project.

2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect , with copy to Contractor. Interpret tests and inspections, and state in each report whether tested and inspected Work complies with or deviates from the Contract Documents.

K. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups of size indicated.
2. Build mockups in location indicated or, if not indicated, as directed by Architect .
3. Notify Architect seven days in advance of dates and times when mockups will be constructed.
4. Employ supervisory personnel who will oversee mockup construction. Employ workers who will be employed to perform same tasks during the construction at Project.
5. Demonstrate the proposed range of aesthetic effects and workmanship.
6. Obtain Architect's approval of mockups before starting corresponding Work, fabrication, or construction.

   a. Allow seven days for initial review and each re-review of each mockup.

7. Promptly correct unsatisfactory conditions noted by Architect's preliminary review, to the satisfaction of the Architect, before completion of final mockup.
8. Approval of mockups by the Architect does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
9. Maintain mockups during construction in an undisturbed condition as a standard for

judging the completed Work.
10. Demolish and remove mockups when directed unless otherwise indicated.

1.8 QUALITY CONTROL

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.

1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspection they are engaged to perform.
2. Costs for retesting and reinspecting construction that replaces or is necessitated by Work that failed to comply with the Contract Documents will be charged to Contractor .

B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities, whether specified or not, to verify and document that the Work complies with requirements.

1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
2. Engage a qualified testing agency to perform quality-control services.

a. Contractor will not employ same entity engaged by Owner, unless agreed to in writing by Owner.

3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspection will be performed.
4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
5. Testing and inspection requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

D. Testing Agency Responsibilities: Cooperate with Architect , Commissioning Authority and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Determine the locations from which test samples will be taken and in which in-situ tests are conducted.
3. Conduct and interpret tests and inspections, and state in each report whether tested

and inspected Work complies with or deviates from requirements.

4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
6. Do not perform duties of Contractor.

E. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 013300 "Submittal Procedures."

F. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.

G. Contractor's Associated Requirements and Services: Cooperate with agencies and representatives performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspection. Assist agency in obtaining samples.
4. Facilities for storage and field curing of test samples.
5. Preliminary design mix proposed for use for material mixes that require control by testing agency.
6. Security and protection for samples and for testing and inspection equipment at Project site.

H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspection.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

1.9 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: Owner will engage a qualified testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner , and as follows:

1. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
2. Submitting a certified written report of each test, inspection, and similar quality-control

service to Architect with copy to Contractor and to authorities having jurisdiction.

3. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
4. Interpreting tests and inspections, and stating in each report whether tested and inspected Work complies with or deviates from the Contract Documents.
5. Retesting and reinspecting corrected Work.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:

1. Date test or inspection was conducted.
2. Description of the Work tested or inspected.
3. Date test or inspection results were transmitted to Architect.
4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's and authorities' having jurisdiction reference during normal working hours.

1. Submit log at Project closeout as part of Project Record Documents.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspection, sample-taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 017300 "Execution."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

SECTION 01410 – STRUCTURAL TESTS AND SPECIAL INSPECTIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements required for compliance with the International Building Code, Chapter 17, Structural Tests and Special Inspections.

B. Structural testing and special inspection services are required to verify compliance with requirements specified or indicated. These services do not relieve contractor of responsibility for compliance with other construction document requirements.

1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the construction document requirements.
3. Requirements for contractor to provide quality-assurance and -control services required by architect, owner, or authorities having jurisdiction are not limited by provisions of this section.

C. The owner will engage one or more qualified special inspectors and / or testing agencies to conduct structural tests and special inspections specified in this section and related sections and as maybe specified in other divisions of these specifications.

D. Related Sections include but are not limited to the following:
1. 03300 CAST-IN-PLACE CONCRETE.
2. 04200 UNIT MASONRY
3. 06100 ROUGH CARPENTRY
4. 06192 FABRICATED WOOD TRUSSES

1.3 DEFINITIONS

A. Approved Agency: An established and recognized agency regularly engaged in conducting tests or furnishing inspection services, when such agency has been approved by the building official.

B. Construction Documents: Written, graphic and pictorial documents prepared or assembled for describing the design, location and physical characteristics of the elements of a project necessary for obtaining a building permit. Construction Documents include all supplemental instructions, sketches, addenda, and revisions to the drawings and specifications issued by the registered design professional beyond those issued for a building permit.

C. Shop Drawings / Submittal Data: Written, graphic and pictorial documents prepared and / or assembled by the contractor based on the Construction Documents.

D. Structural Observation: Visual observation of the structural system by a representative of the registered design professional's office for general conformance to the approved construction documents. Structural observations are not considered part of the structural tests and special inspections and do not replace inspections and testing by the testing agency or special inspector.

E. Special Inspector: A qualified person who demonstrating competence, to the satisfaction of the code enforcement official and registered design professional in responsible charge, for inspection of the particular type of construction or operation requiring special inspection. The special inspector shall be a licensed professional engineer or engineering intern or a qualified representative from the testing agency.

F. Special Inspection, Continuous: The full-time observation of work requiring special inspection by an approved special inspector who is present in the area where the work is being performed.

G. Special Inspection, Periodic: The part-time or intermittent observation of work requiring special inspection by an approved special inspector who is present in the area where the work has been or is being performed and at the completion of the work.

H. Testing Agency: A qualified materials testing laboratory under the responsible charge of a licensed professional engineer, approved by the code enforcement official and the registered design professional in responsible charge, to measure, examine, test, calibrate, or otherwise determine the characteristics or performance of construction materials and verify confirmation with construction documents.

1.4 QUALITY ASSURANCE

A. Testing Agency Qualifications:

1. Minimum qualifications of inspection and testing agencies and their personnel shall comply with ASTM E329-03 Standard Specification for Agencies in the Testing and / or Inspection of Materials Used in Construction.
   a. Inspectors and individuals performing tests shall be certified for the work being performed as outlined in the appendix of the ASTM E329. Certification by organizations other than those listed must be submitted to the building official for consideration before proceeding with work.
2. In addition to these requirements, local jurisdiction may have additional requirements. It is the responsibility of the testing and inspection agencies to meet local requirements and comply with local procedures.

1.5 CONFLICTING REQUIREMENTS, REPORTS, AND TEST RESULTS

A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to the registered design professional in responsible charge for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to the registered design profession in responsible charge for a decision before proceeding.

C. The special inspector's reports and testing agencies results shall have precedence over reports and test results provided by the contractor.

D. Where a conflict exists between the construction documents and approved shop drawings / submittal data, the construction documents shall govern unless the shop drawings / submittal data are more restrictive. All conflicts shall be brought to the attention of the registered design professional in responsible charge.

1.6 SUBMITTALS BY SPECIAL INSPECTOR AND / OR TESTING AGENCY

A. Special inspectors shall keep and distribute records of inspections. The special inspector shall furnish inspection reports to the building official, and to the registered design professional in responsible charge, contractor, architect, and

owner. Reports shall indicate that work inspected was done in conformance to approved construction documents. Discrepancies shall be brought to the immediate attention of the contractor for correction. If the discrepancies are not corrected, the discrepancies shall be brought to the attention of the building official and to the registered design professional in responsible charge prior to the completion of that phase of the work. A final report documenting required special inspections and correction of any discrepancies noted in the inspections shall be submitted at a point in time agreed upon by the permit applicant and the building official prior to the start of work.

1. Special inspection reports and test results shall include, but not be limited to, the following:
    a. Date of inspection.
    b. Description of inspections or tests performed including location (reference grid lines, floors, elevations, etc.).
    c. Statement noting that the work, material, and / or product conforms or does not conform to the construction document requirements.
        1) Name and signature of contractor's representative who was notified of work, material, and / or products that do not meet the construction document requirements.
    d. Name and signature of special inspector and / or testing agency representative performing the work.

B. Schedule of Non-Compliant Work: Each agent shall maintain a log of work that does not meet the requirements of the construction documents. Include reference to original inspection / test report and subsequent dates of re-inspection / retesting.

C. Reports and tests shall be submitted within 1 week of inspection or test. Schedule of Non-Compliant Work shall be updated daily and submitted at monthly intervals.

D. Final Report of Special Inspections. Submitted by each agent listed in the schedule of Structural Testing and Special Inspections.

PART 2 - PRODUCTS (not used)

PART 3 - EXECUTION

3.1 CONTRACTOR'S RESPONSIBILITY

A. The contractor shall coordinate the inspection and testing services with the progress of the work. The contractor shall provide sufficient notice to allow proper scheduling of all personnel. The contractor shall provide safe access for performing inspection and on site testing.

B. The contractor shall submit schedules to the owner, registered design professionals and testing and inspecting agencies. Schedules will note milestones and durations of time for materials requiring structural tests and special inspections.

C. The contractor shall repair and / or replace work that does not meet the requirements of the construction documents.
   1. Contractor shall engage an engineer / architect to prepare repair and / or replacement procedures.
   2. Engineer / architect shall be registered in the state in which the project is located. Engineer shall be acceptable to the registered design professional in responsible charge, code enforcement official, and owner.
   3. Procedures shall be submitted for review and acceptance by the registered design professional in responsible charge, code enforcement official, and owner before proceeding with corrective action.

D. The contractor shall be responsible for costs of:
   1. Re-testing and re-inspection of materials, work, and / or products that do not meet the requirements of the construction documents and shop drawings / submittal data.
   2. Review of proposed repair and / or replacement procedures by the registered design professional in responsible charge and the inspectors and testing agencies.
   3. Repair or replacement of work that does not meet the requirements of the construction documents.

3.2 STRUCTURAL OBSERVATIONS

A. Structural observations may be made periodically as determined by the registered design professional in responsible charge.

3.3 TESTING AND INSPECTION

A. Testing and inspection shall be in accordance with the attached Schedule of Special Inspections.

B. Reference related specifications for the minimum level of inspections and testing. Provide additional inspections and testing as necessary to determine compliance with the construction drawings.

PART 4 - SCHEDULES AND FORMS

4.1 STATEMENT OF SPECIAL INSPECTIONS.

4.2 SCHEDULE OF SPECIAL INSPECTIONS. (See Contract Drawings)

4.3 FINAL REPORT OF SPECIAL INSPECTIONS.

END OF SECTION 01410

SECTION 014200 - REFERENCES

PART 1 - GENERAL

1.1 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.

B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

C. "Directed": A command or instruction by Architect. Other terms, including "requested," "authorized," "selected," "required," and "permitted," have the same meaning as "directed."

D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms, including "shown," "noted," "scheduled," and "specified," have the same meaning as "indicated."

E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.

H. "Provide": Furnish and install, complete and ready for the intended use.

I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.2 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.

1. For standards referenced by applicable building codes, comply with dates of standards

as listed in building codes.

C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.3 ABBREVIATIONS AND ACRONYMS

A. Industry Organizations, List: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they are to mean the recognized name of the entities in the following list. Abbreviations and acronyms not included in this list are to mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States." The information in this list is subject to change and is believed to be accurate as of the date of the Contract Documents.

1. AABC - Associated Air Balance Council; www.aabc.com.
2. AAMA - American Architectural Manufacturers Association; (see FGIA).
3. AAPFCO - Association of American Plant Food Control Officials; www.aapfco.org.
4. AASHTO - American Association of State Highway and Transportation Officials; www.transportation.org.
5. AATCC - American Association of Textile Chemists and Colorists; www.aatcc.org.
6. ABMA - American Bearing Manufacturers Association; www.americanbearings.org.
7. ABMA - American Boiler Manufacturers Association; www.abma.com.
8. ACI - American Concrete Institute; www.concrete.org.
9. ACP - American Clean Power; (Formerly: American Wind Energy Association); www.cleanpower.org.
10. ACPA - American Concrete Pipe Association; www.concretepipe.org.
11. AEIC - Association of Edison Illuminating Companies, Inc. (The); www.aeic.org.
12. AF&PA - American Forest & Paper Association; www.afandpa.org.
13. AGA - American Gas Association; www.aga.org.
14. AHAM - Association of Home Appliance Manufacturers; www.aham.org.
15. AHRI - Air-Conditioning, Heating, and Refrigeration Institute (The); www.ahrinet.org.
16. AI - Asphalt Institute; www.asphaltinstitute.org.
17. AIA - American Institute of Architects (The); www.aia.org.
18. AISC - American Institute of Steel Construction; www.aisc.org.
19. AISI - American Iron and Steel Institute; www.steel.org.
20. AITC - American Institute of Timber Construction; (see PLIB).
21. AMCA - Air Movement and Control Association International, Inc.; www.amca.org.
22. AMPP - Association for Materials Protection and Performance; www.ampp.org.
23. ANSI - American National Standards Institute; www.ansi.org.
24. AOSA/SCST - Association of Official Seed Analysts (The)/Society of Commercial Seed Technologists (The); www.analyzeseeds.com.
25. APA - APA - The Engineered Wood Association; www.apawood.org.

26. APA - Architectural Precast Association; www.archprecast.org.
27. API - American Petroleum Institute; www.api.org.
28. ARMA - Asphalt Roofing Manufacturers Association; www.asphaltroofing.org.
29. ASA - Acoustical Society of America; www.acousticalsociety.org.
30. ASCE - American Society of Civil Engineers; www.asce.org.
31. ASCE/SEI - American Society of Civil Engineers/Structural Engineering Institute; (see ASCE).
32. ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers; www.ashrae.org.
33. ASME - ASME International; American Society of Mechanical Engineers (The); www.asme.org.
34. ASSE - ASSE International; (American Society of Sanitary Engineering); www.asse-plumbing.org.
35. ASSP - American Society of Safety Professionals; www.assp.org.
36. ASTM - ASTM International; www.astm.org.
37. ATIS - Alliance for Telecommunications Industry Solutions; www.atis.org.
38. AVIXA - Audiovisual and Integrated Experience Association; www.avixa.org.
39. AWI - Architectural Woodwork Institute; www.awinet.org.
40. AWMAC - Architectural Woodwork Manufacturers Association of Canada; www.awmac.com.
41. AWPA - American Wood Protection Association; www.awpa.com.
42. AWS - American Welding Society; www.aws.org.
43. AWWA - American Water Works Association; www.awwa.org.
44. BHMA - Builders Hardware Manufacturers Association; www.buildershardware.com.
45. BIA - Brick Industry Association (The); www.gobrick.com.
46. BICSI - BICSI, Inc.; www.bicsi.org.
47. BIFMA - Business and Institutional Furniture Manufacturer's Association; www.bifma.org.
48. BISSC - Baking Industry Sanitation Standards Committee; www.bissc.org.
49. BSI - British Standards Institution; www.bsigroup.com.
50. BWF - Badminton World Federation; www.bwfbadminton.com.
51. CARB - California Air Resources Board; www.arb.ca.gov.
52. CDA - Copper Development Association Inc.; www.copper.org.
53. CE - Conformite Europeenne (European Commission); www.ec.europa.eu/growth/single-market/ce-marking.
54. CEA - Canadian Electricity Association; www.electricity.ca.
55. CFFA - Chemical Fabrics and Film Association, Inc.; www.chemicalfabricsandfilm.com.
56. CFSEI - Cold-Formed Steel Engineers Institute; www.cfsei.org.
57. CGA - Compressed Gas Association; www.cganet.com.
58. CIMA - Cellulose Insulation Manufacturers Association; www.cellulose.org.
59. CISCA - Ceilings & Interior Systems Construction Association; www.cisca.org.
60. CISPI - Cast Iron Soil Pipe Institute; www.cispi.org.
61. CLFMI - Chain Link Fence Manufacturers Institute; www.chainlinkinfo.org.
62. CMHA - Concrete Masonry & Hardscape Association; (Formerly: National Concrete Masonry Association); www.masonryandhardscapes.org.
63. CPA - Composite Panel Association; www.compositepanel.org.
64. CRI - Carpet and Rug Institute (The); www.carpet-rug.org.
65. CRRC - Cool Roof Rating Council; www.coolroofs.org.

66. CRSI - Concrete Reinforcing Steel Institute; www.crsi.org.
67. CSA - CSA Group; www.csagroup.org.
68. CSI - Cast Stone Institute; www.caststone.org.
69. CSI - Construction Specifications Institute (The); www.csiresources.org.
70. CSSB - Cedar Shake & Shingle Bureau; www.cedarbureau.org.
71. CTA - Consumer Technology Association; www.cta.tech.
72. CTI - Cooling Technology Institute; www.coolingtechnology.org.
73. DASMA - Door and Access Systems Manufacturers Association; www.dasma.com.
74. DHA - Decorative Hardwoods Association; www.decorativehardwoods.org.
75. DHI - Door and Hardware Institute; www.dhi.org.
76. ECIA - Electronic Components Industry Association; www.ecianow.org.
77. EIMA - EIFS Industry Members Association; www.eima.com.
78. EJMA - Expansion Joint Manufacturers Association, Inc.; www.ejma.org.
79. EOS/ESD - EOS/ESD Association, Inc.; Electrostatic Discharge Association; www.esda.org.
80. ESTA - Entertainment Services and Technology Association; www.esta.org.
81. EVO - Efficiency Valuation Organization; www.evo-world.org.
82. FCI - Fluid Controls Institute; www.fluidcontrolsinstitute.org.
83. FGIA - Fenestration and Glazing Industry Alliance; https://fgiaonline.org.
84. FIBA - Federation Internationale de Basketball; (The International Basketball Federation); www.fiba.com.
85. FIVB - Federation Internationale de Volleyball; (The International Volleyball Federation); www.fivb.org.
86. FM Approvals - FM Approvals LLC; www.fmapprovals.com.
87. FM Global - FM Global; www.fmglobal.com.
88. FRSA - Florida Roofing and Sheet Metal Contractors Association, Inc.; www.floridaroof.com.
89. FSA - Fluid Sealing Association; www.fluidsealing.com.
90. FSC - Forest Stewardship Council U.S.; www.fscus.org.
91. GA - Gypsum Association; www.gypsum.org.
92. GS - Green Seal; www.greenseal.org.
93. HI - Hydraulic Institute; www.pumps.org.
94. HMMA - Hollow Metal Manufacturers Association; (see NAAMM).
95. IAPSC - International Association of Professional Security Consultants; www.iapsc.org.
96. IAS - International Accreditation Service; www.iasonline.org.
97. ICC - International Code Council; www.iccsafe.org.
98. ICEA - Insulated Cable Engineers Association, Inc.; www.icea.net.
99. ICPA - International Cast Polymer Association (The); www.theicpa.com.
100. ICRI - International Concrete Repair Institute, Inc.; www.icri.org.
101. IEC - International Electrotechnical Commission; www.iec.ch.
102. IEEE SA - IEEE Standards Association; https://standards.ieee.org.
103. IES - Illuminating Engineering Society; www.ies.org.
104. IEST - Institute of Environmental Sciences and Technology; www.iest.org.
105. IGMA - Insulating Glass Manufacturers Alliance; (see FGIA).
106. IGSHPA - International Ground Source Heat Pump Association; www.igshpa.org.
107. ILI - Indiana Limestone Institute of America, Inc.; www.iliai.com.
108. Intertek - Intertek Group; www.intertek.com.
109. ISA - International Society of Automation (The); www.isa.org.
110. ISFA - International Surface Fabricators Association; www.isfanow.org.

111. ISO - International Organization for Standardization; www.iso.org.
112. ITU - International Telecommunication Union; www.itu.int.
113. KCMA - Kitchen Cabinet Manufacturers Association; www.kcma.org.
114. LPI - Lightning Protection Institute; www.lightning.org.
115. MBMA - Metal Building Manufacturers Association; www.mbma.com.
116. MCA - Metal Construction Association; www.metalconstruction.org.
117. MFMA - Maple Flooring Manufacturers Association, Inc.; www.maplefloor.org.
118. MFMA - Metal Framing Manufacturers Association, Inc.; www.metalframingmfg.org.
119. MHI - Material Handling Industry; www.mhi.org.
120. MMPA - Moulding & Millwork Producers Association; www.wmmpa.com.
121. MPI - Master Painters Institute; www.paintinfo.com.
122. MSS - Manufacturers Standardization Society of The Valve and Fittings Industry, Inc.; www.msshq.org.
123. NAAMM - National Association of Architectural Metal Manufacturers; www.naamm.org.
124. NACE - NACE International; (National Association of Corrosion Engineers International); (see AMPP).
125. NADCA - National Air Duct Cleaners Association; www.nadca.com.
126. NAIMA - North American Insulation Manufacturers Association; www.insulationinstitute.org.
127. NALP - National Association of Landscape Professionals; www.landscapeprofessionals.org.
128. NBGQA - National Building Granite Quarries Association, Inc.; www.nbgqa.com.
129. NBI - New Buildings Institute; www.newbuildings.org.
130. NCAA - National Collegiate Athletic Association (The); www.ncaa.org.
131. NCMA - National Concrete Masonry Association; (see CMHA).
132. NEBB - National Environmental Balancing Bureau; www.nebb.org.
133. NECA - National Electrical Contractors Association; www.necanet.org.
134. NeLMA - Northeastern Lumber Manufacturers Association; www.nelma.org.
135. NEMA - National Electrical Manufacturers Association; www.nema.org.
136. NETA - InterNational Electrical Testing Association; www.netaworld.org.
137. NFHS - National Federation of State High School Associations; www.nfhs.org.
138. NFPA - National Fire Protection Association; www.nfpa.org.
139. NFPA - NFPA International; (see NFPA).
140. NFRC - National Fenestration Rating Council; www.nfrc.org.
141. NGA - National Glass Association; www.glass.org.
142. NHLA - National Hardwood Lumber Association; www.nhla.com.
143. NLGA - National Lumber Grades Authority; www.nlga.org.
144. NOFMA - National Oak Flooring Manufacturers Association; (see NWFA).
145. NOMMA - National Ornamental & Miscellaneous Metals Association; www.nomma.org.
146. NRCA - National Roofing Contractors Association; www.nrca.net.
147. NRMCA - National Ready Mixed Concrete Association; www.nrmca.org.
148. NSF - NSF International; www.nsf.org.
149. NSI - Natural Stone Institute; www.naturalstoneinstitute.org.
150. NSPE - National Society of Professional Engineers; www.nspe.org.
151. NSSGA - National Stone, Sand & Gravel Association; www.nssga.org.
152. NTMA - National Terrazzo & Mosaic Association, Inc. (The); www.ntma.com.
153. NWFA - National Wood Flooring Association; www.nwfa.org.
154. NWRA - National Waste & Recycling Association; www.wasterecycling.org.

155. PCI - Precast/Prestressed Concrete Institute; www.pci.org.
156. PDI - Plumbing & Drainage Institute; www.pdionline.org.
157. PLASA - PLASA; www.plasa.org.
158. PLIB - Pacific Lumber Inspection Bureau; www.plib.org.
159. PVCPA - Uni-Bell PVC Pipe Association; www.uni-bell.org.
160. RCSC - Research Council on Structural Connections; www.boltcouncil.org.
161. RFCI - Resilient Floor Covering Institute; www.rfci.com.
162. RIS - Redwood Inspection Service; (see WWPA).
163. SAE - SAE International; www.sae.org.
164. SCTE - Society of Cable Telecommunications Engineers; www.scte.org.
165. SDI - Steel Deck Institute; www.sdi.org.
166. SDI - Steel Door Institute; www.steeldoor.org.
167. SEFA - Scientific Equipment and Furniture Association (The); www.sefalabs.com.
168. SEI/ASCE - Structural Engineering Institute/American Society of Civil Engineers; (see ASCE).
169. SIA - Security Industry Association; www.securityindustry.org.
170. SJI - Steel Joist Institute; www.steeljoist.org.
171. SMA - Screen Manufacturers Association; www.smainfo.org.
172. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association; www.smacna.org.
173. SMPTE - Society of Motion Picture and Television Engineers; www.smpte.org.
174. SPFA - Spray Polyurethane Foam Alliance; www.sprayfoam.org.
175. SPIB - Southern Pine Inspection Bureau; www.spib.org.
176. SPRI - Single Ply Roofing Industry; www.spri.org.
177. SRCC - Solar Rating & Certification Corporation; www.solar-rating.org.
178. SSINA - Specialty Steel Industry of North America; www.ssina.com.
179. SSPC - SSPC: The Society for Protective Coatings; (see AMPP).
180. STI/SPFA - Steel Tank Institute/Steel Plate Fabricators Association; www.steeltank.com.
181. SWI - Steel Window Institute; www.steelwindows.com.
182. SWPA - Submersible Wastewater Pump Association; www.swpa.org.
183. TCA - Tilt-Up Concrete Association; www.tilt-up.org.
184. TCNA - Tile Council of North America, Inc.; www.tcnatile.com.
185. TEMA - Tubular Exchanger Manufacturers Association, Inc.; www.kbcdco.tema.org.
186. TIA - Telecommunications Industry Association; www.tiaonline.org.
187. TMS - The Masonry Society; www.masonrysociety.org.
188. TPI - Truss Plate Institute; www.tpinst.org.
189. TPI - Turfgrass Producers International; www.turfgrasssod.org.
190. TRI - Tile Roofing Industry Alliance; www.tileroofing.org.
191. ULSE - UL Standards & Engagement Inc.; www.ulse.org.
192. UL - UL Solutions Inc.; www.ul.com.
193. USGBC - U.S. Green Building Council; www.usgbc.org.
194. USITT - United States Institute for Theatre Technology, Inc.; www.usitt.org.
195. WA - Wallcoverings Association; www.wallcoverings.org.
196. WCLIB - West Coast Lumber Inspection Bureau; (see PLIB).
197. WCMA - Window Covering Manufacturers Association; www.wcmanet.org.
198. WDMA - Window & Door Manufacturers Association; www.wdma.com.
199. WI - Woodwork Institute; www.woodworkinstitute.com.
200. WSRCA - Western States Roofing Contractors Association; www.wsrca.com.

201. WWPA - Western Wood Products Association; www.wwpa.org.

B. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they are to mean the recognized name of the entities in the following list. This information is believed to be accurate as of the date of the Contract Documents.

1. IAPMO - International Association of Plumbing and Mechanical Officials; www.iapmo.org.
2. ICC - International Code Council; www.iccsafe.org.
3. ICC-ES - ICC Evaluation Service, LLC; www.icc-es.org.

C. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they are to mean the recognized name of the entities in the following list. Information is subject to change and is up to date as of the date of the Contract Documents.

1. CPSC - U.S. Consumer Product Safety Commission; www.cpsc.gov.
2. DOC - U.S. Department of Commerce; www.commerce.gov.
3. DOD - U.S. Department of Defense; www.defense.gov.
4. DOE - U.S. Department of Energy; www.energy.gov.
5. DOJ - U.S. Department of Justice; www.ojp.usdoj.gov
6. DOS - U.S. Department of State; www.state.gov.
7. EPA - United States Environmental Protection Agency; www.epa.gov.
8. FAA - Federal Aviation Administration; www.faa.gov.
9. GPO - U.S. Government Publishing Office; www.gpo.gov.
10. GSA - U.S. General Services Administration; www.gsa.gov.
11. HUD - U.S. Department of Housing and Urban Development; www.hud.gov.
12. LBNL - Lawrence Berkeley National Laboratory; Energy Technologies Area; www.lbl.gov/.
13. NIST - National Institute of Standards and Technology; www.nist.gov.
14. OSHA - Occupational Safety & Health Administration; www.osha.gov.
15. TRB - Transportation Research Board; National Cooperative Highway Research Program; The National Academies; www.trb.org.
16. USACE - U.S. Army Corps of Engineers; www.usace.army.mil.
17. USDA - U.S. Department of Agriculture; Agriculture Research Service; U.S. Salinity Laboratory; www.ars.usda.gov.
18. USDA - U.S. Department of Agriculture; Rural Utilities Service; www.usda.gov.
19. USP - U.S. Pharmacopeial Convention; www.usp.org.
20. USPS - United States Postal Service; www.usps.com.

D. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they are to mean the recognized name of the standards and regulations in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

1. CFR - Code of Federal Regulations; Available from U.S. Government Publishing Office; www.govinfo.gov.
2. DOD - U.S. Department of Defense; Military Specifications and Standards; Available from DLA Document Services; www.dsp.dla.mil/Specs-Standards/.

3. DSCC - Defense Supply Center Columbus; (see FS).
4. FED-STD - Federal Standard; (see FS).
5. FS - Federal Specification; Available from DLA Document Services; www.dsp.dla.mil/Specs-Standards/.

    a. Available from Defense Standardization Program; www.dsp.dla.mil.
    b. Available from U.S. General Services Administration; www.gsa.gov.
    c. Available from National Institute of Building Sciences/Whole Building Design Guide; www.wbdg.org.

6. MILSPEC - Military Specifications and Standards; (see DOD).
7. USAB - United States Access Board; www.access-board.gov.
8. USATBCB - U.S. Architectural & Transportation Barriers Compliance Board; (see USAB).

E. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they are to mean the recognized name of the entities in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

1. BEARHFTI; California Bureau of Electronic and Appliance Repair, Home Furnishings and Thermal Insulation; (see BHGS).
2. BHGS; State of California Bureau of Household Goods and Services; (Formerly: California Bureau of Electronic and Appliance Repair, Home Furnishings and Thermal Insulation); www.bhgs.dca.ca.gov.
3. CCR; California Code of Regulations; Office of Administrative Law; California Title 24 Energy Code; www.oal.ca.gov/publications/ccr/.
4. CDPH; California Department of Public Health; Indoor Air Quality Program; www.cdph.ca.gov/Programs/CCDPHP/DEODC/EHLB/IAQ/Pages/Main-Page.aspx.
5. CPUC; California Public Utilities Commission; www.cpuc.ca.gov.
6. SCAQMD; South Coast Air Quality Management District; www.aqmd.gov.
7. TFS; Texas A&M Forest Service; Sustainable Forestry and Economic Development; https://tfsweb.tamu.edu/.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF SECTION 014200

SECTION 014339 - MOCKUPS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Integrated exterior mockups.

B. Related Requirements:

1. Section 014000 "Quality Requirements" for quality assurance requirements for aesthetic and workmanship mockups specified in other Sections.

1.2 DEFINITIONS

A. Integrated Exterior Mockups: Mockups of the exterior envelope constructed on-site as freestanding temporary built elements, consisting of multiple products, assemblies, and subassemblies.

1.3 QUALITY ASSURANCE

A. Build mockups to do the following:

1. Verify selections made under Sample submittals.
2. Demonstrate aesthetic effects.
3. Demonstrate the qualities of products and workmanship.
4. Demonstrate acceptable coordination between components and systems.

B. Fabrication: Before fabricating or installing portions of the Work requiring mockups, build mockups for each form of construction and finish required. Use materials and installation methods as required for the Work.

1. Build mockups of size indicated.
2. Build mockups in location indicated or, if not indicated, as directed by Architect .
3. Employ supervisory personnel who will oversee mockup construction. Employ workers who will be employed to perform same tasks during the construction at Project.
4. Demonstrate the proposed range of aesthetic effects and workmanship.
5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
6. Demolish and remove mockups when directed unless otherwise indicated.

C. Notifications:

1. Notify Architect seven days in advance of the dates and times when mockups will be constructed.
2. Allow seven days for initial review and each re-review of each mockup.

D. Approval: Obtain Architect's approval of mockups before starting fabrication or construction of corresponding Work.

1. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

1.4 COORDINATION

A. Coordinate schedule for construction of mockups, so construction, testing, and review of mockups do not impact Project schedule.

PART 2 - PRODUCTS

2.1 INTEGRATED EXTERIOR MOCKUPS

A. Construct integrated exterior mockups as indicated on Drawings. Construct mockups to demonstrate constructability, coordination of trades, and sequencing of Work; and to ensure materials, components, subassemblies, assemblies, and interfaces integrate into a system complying with indicated performance and aesthetic requirements.

B. Design and construct foundation and superstructure to support free-standing integrated exterior mockups.

C. Build integrated exterior mockups using installers and construction methods that will be used in completed construction.

D. Use specified products that have been approved by Architect. Coordinate installation of materials and products specified in individual Specification Sections that include Work included in integrated exterior mockups.

E. The Work of integrated exterior mockups includes, but is not limited to, the following:

1. Masonry veneer.
2. Air and weather barriers.
3. Thermal insulation.
4. Through-wall flashing.
5. Flashing and sheet metal trim.
6. Joint sealants.
7. Concrete Masonry Units.

8. Unit Window.

F. Provide and document modifications to construction details and interfaces between components and systems required to properly sequence the Work, or to pass performance testing requirements. Obtain Architect's approval for modifications.

PART 3 - EXECUTION (Not Used)

END OF SECTION 014339

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

B. Related Requirements:

1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.

1.2 USE CHARGES

A. Installation, removal, and use charges for temporary facilities to be included in the Contract Sum unless otherwise indicated. Allow other entities engaged in the Project to use temporary services and facilities without cost, including, but not limited to, Architect, testing agencies, and authorities having jurisdiction.

B. Water and Sewer Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

C. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.3 QUALITY ASSURANCE

A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

PART 2 - PRODUCTS

2.1 TEMPORARY FACILITIES

A. Field Offices:

1. Owner will provide conditioned interior space for field offices for duration of Project.

2.2 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.

1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
2. Heating, Cooling, and Dehumidifying Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.

PART 3 - EXECUTION

3.1 TEMPORARY FACILITIES, GENERAL

A. Conservation: Coordinate construction and use of temporary facilities with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

3.2 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

1. Locate facilities to limit site disturbance as specified in Section 011000 "Summary."

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.3 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.

1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.

1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.

C. Water Service:

1. Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

D. Sanitary Facilities: Provide temporary toilets, wash facilities, safety shower and eyewash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

1. Use of Permanent Toilets: Use of Owner's existing or new toilet facilities is not permitted.

E. Temporary Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.

1. Provide temporary dehumidification systems when required to reduce ambient and substrate moisture levels to level required to allow installation or application of finishes and their proper curing or drying.

F. Electric Power Service:

1. Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.

G. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

3.4 SUPPORT FACILITIES INSTALLATION

A. Comply with the following:

1. Utilize designated area within existing building for temporary field offices.
2. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Temporary Use of Planned Permanent Roads and Paved Areas: Locate temporary roads and paved areas in same location as permanent roads and paved areas. Construct and maintain temporary roads and paved areas adequate for construction operations. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction

operations.

1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
2. Prepare subgrade and install subbase and base for temporary roads and paved areas in accordance with Section 312000 "Earth Moving."
3. Delay installation of final course of permanent hot-mix asphalt pavement until immediately before Substantial Completion. Repair hot-mix asphalt base-course pavement before installation of final course in accordance with Section 321216 "Asphalt Paving."

C. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Protect existing site improvements to remain, including curbs, pavement, and utilities.
2. Maintain access for fire-fighting equipment and access to fire hydrants.

D. Parking: Use designated areas of Owner's existing parking areas for construction personnel.

E. Storage and Staging: Use designated areas of Project site for storage and staging needs.

F. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.

1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.

G. Waste Disposal Facilities:

1. Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 017300 "Execution."

3.5 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

1. Where access to adjacent properties is required in order to affect protection of existing facilities, obtain written permission from adjacent property owner to access property for that purpose.

B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

1. Comply with work restrictions specified in Section 011000 "Summary."

C. Temporary Erosion and Sedimentation Control:

D. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.

E. Tree and Plant Protection:

1. Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.

F. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, termites, and other pests and to perform extermination and control procedures at regular intervals, so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using materials approved by authorities having jurisdiction.

G. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

H. Temporary Egress: Provide temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction. Provide signage directing occupants to temporary egress.

I. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.

J. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.

1. Prohibit smoking in construction areas. Comply with additional limits on smoking specified in other Sections.
2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition in accordance with requirements of authorities having jurisdiction.
3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign, stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.6 MOISTURE AND MOLD CONTROL

A. Moisture and Mold Protection: Protect stored materials and installed Work in accordance with Moisture and Mold Protection Plan.

B. Exposed Construction Period: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:

1. Protect porous materials from water damage.
2. Protect stored and installed material from flowing or standing water.
3. Keep porous and organic materials from coming into prolonged contact with concrete.
4. Remove standing water from decks.
5. Keep deck openings covered or dammed.

C. Partially Enclosed Construction Period: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:

1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
2. Keep interior spaces reasonably clean and protected from water damage.
3. Periodically collect and remove waste containing cellulose or other organic matter.
4. Discard or replace water-damaged material.
5. Do not install material that is wet.
6. Discard and replace stored or installed material that begins to grow mold.
7. Perform work in a sequence that allows wet materials adequate time to dry before enclosing the material in gypsum board or other interior finishes.

D. Controlled Construction Period: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:

1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
2. Use temporary or permanent HVAC system to control humidity within ranges specified for installed and stored materials.
3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.

    a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for 48 hours are considered defective and require replacing.
    b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at time of exposure and continuing daily for 48 hours. Identify materials containing moisture levels higher than allowed. Report findings in writing to Architect.
    c. Remove and replace materials that cannot be completely restored to their manufactured moisture level within 48 hours.

3.7 OPERATION, TERMINATION, AND REMOVAL

A. Maintenance: Maintain facilities in good operating condition until removal.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

B. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

C. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 015000

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. The Work of This Section Includes: Administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

B. Related Requirements:

1. Section 011000 "Summary" for Contractor requirements related to Owner-furnished products.
2. Section 012100 "Allowances" for products selected under an allowance.
3. Section 012300 "Alternates" for products selected under an alternate.
4. Section 012500 "Substitution Procedures" for requests for substitutions.
5. Section 014200 "References" for applicable industry standards for products specified.
6. Section 017700 "Closeout Procedures" for submitting warranties.

1.2 DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility. Salvaged items or items reused from other projects are not considered new products. Items that are manufactured or fabricated to include recycled content materials are considered new products unless otherwise indicated.
3. Comparable Product: Product by named manufacturer that is demonstrated and approved through the comparable product submittal process described in "Comparable Products" Article, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Basis-of-Design Product Specification: A specification in which a single manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. Published attributes and characteristics of basis-of-design product establish salient characteristics of products.

1. Evaluating Comparable Products: In addition to the basis-of-design product description,

product attributes and characteristics may be listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other special features and requirements for purposes of evaluating comparable products of additional manufacturers named in the specification. Manufacturer's published attributes and characteristics of basis-of-design product also establish salient characteristics of products for purposes of evaluating comparable products.

C. Subject to Compliance with Requirements: Where the phrase "Subject to compliance with requirements" introduces a product selection procedure in an individual Specification Section, provide products qualified under the specified product procedure. In the event that a named product or product by a named manufacturer does not meet the other requirements of the specifications, select another named product or product from another named manufacturer that does meet the requirements of the specifications; submit a comparable product request or substitution request, if applicable.

D. Comparable Product Request Submittal: An action submittal requesting consideration of a comparable product, including the following information:

1. Identification of basis-of-design product or fabrication or installation method to be replaced, including Specification Section number and title and Drawing numbers and titles.
2. Data indicating compliance with the requirements specified in "Comparable Products" Article.

E. Basis-of-Design Product Specification Submittal: An action submittal complying with requirements in Section 013300 "Submittal Procedures."

F. Substitution: Refer to Section 012500 "Substitution Procedures" for definition and limitations on substitutions.

1.3 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

B. Identification of Products: Except for required labels and operating data, do not attach or imprint manufacturer or product names or trademarks on exposed surfaces of products or equipment that will be exposed to view in occupied spaces or on the exterior.

1. Labels: Locate required product labels and stamps on a concealed surface, or, where required for observation following installation, on a visually accessible surface that is inconspicuous.
2. Equipment Nameplates: Provide a permanent nameplate on each item of service- or power-operated equipment. Locate on a visually accessible but inconspicuous surface. Include information essential for operation, including the following:

a. Name of product and manufacturer.
b. Model and serial number.
c. Capacity.
d. Speed.
e. Ratings.

3. See individual identification Sections in Divisions 21, 22, 23, and 26 for additional equipment identification requirements.

1.4 COORDINATION

A. Modify or adjust affected work as necessary to integrate work of approved comparable products and approved substitutions.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products, using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to determine compliance with the Contract Documents and that products are undamaged and properly protected.

C. Storage:

1. Provide a secure location and enclosure at Project site for storage of materials and equipment.
2. Store products to allow for inspection and measurement of quantity or counting of units.
3. Store materials in a manner that will not endanger Project structure.
4. Store products that are subject to damage by the elements under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation and with adequate protection from wind.
5. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.

7. Protect stored products from damage and liquids from freezing.

1.6 PRODUCT WARRANTIES

A. Warranties specified in other Sections are to be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Written standard warranty form furnished by individual manufacturer for a particular product and issued in the name of Owner or endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner and issued in the name of Owner or endorsed by manufacturer to Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included in the Project Manual, prepare a written document, using indicated form properly executed.
3. See other Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Section 017700 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties meeting requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Descriptive, performance, and reference standard requirements in Specifications establish salient characteristics of products.

6. Or Equal: For products specified by name and accompanied by the term "or equal," "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.

    a. Submit additional documentation required by Architect in order to establish equivalency of proposed products. Unless otherwise indicated, evaluation of "or equal" product status is by Architect, whose determination is final.

B. Product Selection Procedures:

1. Sole Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

    a. Sole product may be indicated by the phrase "Subject to compliance with requirements, provide the following."

2. Sole Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

    a. Sole manufacturer/source may be indicated by the phrase "Subject to compliance with requirements, provide products by the following."

3. Limited List of Products: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered unless otherwise indicated.

    a. Limited list of products may be indicated by the phrase "Subject to compliance with requirements, provide one of the following."

4. Non-Limited List of Products: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed or an unnamed product that complies with requirements.

    a. Non-limited list of products is indicated by the phrase "Subject to compliance with requirements, available products that may be incorporated in the Work include, but are not limited to, the following."
    b. Provision of an unnamed product is not considered a substitution, if the product complies with requirements.

5. Limited List of Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered unless otherwise indicated.

    a. Limited list of manufacturers is indicated by the phrase "Subject to compliance

with requirements, provide products by one of the following."

6. Non-Limited List of Manufacturers: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed or a product by an unnamed manufacturer that complies with requirements.

    a. Non-limited list of manufacturers is indicated by the phrase "Subject to compliance with requirements, available manufacturers whose products may be incorporated in the Work include, but are not limited to, the following."
    b. Provision of products of an unnamed manufacturer is not considered a substitution, if the product complies with requirements.

7. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications may additionally indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

    a. For approval of products by unnamed manufacturers, comply with requirements in Section 012500 "Substitution Procedures" for substitutions for convenience.

C. Visual Matching Specification: Where Specifications require the phrase "match Architect's sample," provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.

1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 012500 "Substitution Procedures" for proposal of product.

D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or a similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

A. Conditions for Consideration of Comparable Products: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with the following requirements:

1. Evidence that proposed product does not require revisions to the Contract Documents, is consistent with the Contract Documents, will produce the indicated results, and is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with those of the named basis-of-design product. Significant product qualities include attributes such as

type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other specific features and requirements.

3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects, with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

B. Architect's Action on Comparable Products Submittal: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for a comparable product. Architect will notify Contractor of approval or rejection of proposed comparable product within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

1. Architect's Approval of Submittal: Marked with approval notation from Architect's action stamp. See Section 013300 "Submittal Procedures."
2. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.

C. Submittal Requirements, Two-Step Process: Approval by Architect of Contractor's request for use of comparable product is not intended to satisfy other submittal requirements. Comply with specified submittal requirements.

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work, including, but not limited to, the following:

1. Construction layout.
2. Field engineering.
3. Installation.
4. Cutting and patching.
5. Coordination of Owner's portion of the Work.
6. Progress cleaning.
7. Starting and adjusting.
8. Protection of installed construction.
9. Correction of the Work.

B. Related Requirements:

1. Section 011000 "Summary" for coordination of Owner-furnished products, and limits on use of Project site.
2. Section 013300 "Submittal Procedures" for submitting surveys.
3. Section 017700 "Closeout Procedures" for submitting final property survey with Project Record Documents, replacing defective work, and final cleaning.
4. Section 024119 "Selective Demolition" for demolition and removal of selected portions of the building.
5. Section 078413 "Penetration Firestopping" for patching penetrations in fire-rated construction.

1.2 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of subsequent work.

B. Patching: Fitting and repair work required to restore construction to original conditions after installation of subsequent work.

1.3 QUALITY ASSURANCE

A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

B. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1. Structural Elements: When cutting and patching structural elements, or when encountering the need for cutting and patching of elements whose structural function is not known, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include the following:

    a. Primary operational systems and equipment.
    b. Fire separation assemblies.
    c. Air or smoke barriers.
    d. Fire-suppression systems.
    e. Plumbing piping systems.
    f. Mechanical systems piping and ducts.
    g. Control systems.
    h. Communication systems.
    i. Fire-detection and -alarm systems.
    j. Electrical wiring systems.

3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:

    a. Water, moisture, or vapor barriers.
    b. Membranes and flashings.
    c. Exterior curtain-wall construction.
    d. Sprayed fire-resistive material.
    e. Equipment supports.
    f. Piping, ductwork, vessels, and equipment.
    g. Noise- and vibration-control elements and systems.

4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of specified products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Comply with requirements specified in other Sections.

B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials. Use materials that are not considered hazardous.

C. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, gas service piping, and water-service piping; underground electrical services; and other utilities.
2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

C. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding

with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect in accordance with requirements in Section 013100 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks and existing conditions. If discrepancies are discovered, notify Architect promptly.

B. Engage a land surveyor experienced in laying out the Work, using the following accepted surveying practices:

1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
2. Establish limits on use of Project site.
3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
4. Inform installers of lines and levels to which they must comply.
5. Check the location, level and plumb, of every major element as the Work progresses.
6. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.

D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building

foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect .

3.4 FIELD ENGINEERING

A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect . Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.
2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

B. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.

1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

C. Final Property Survey: Engage a land surveyor to prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.

1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.
2. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

3.5 INSTALLATION

A. Locate the Work and components of the Work accurately, in correct alignment and elevation,

as indicated.

1. Make vertical work plumb, and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
4. Maintain minimum headroom clearance of 96 inches in occupied spaces and 90 inches in unoccupied spaces, unless otherwise indicated on Drawings.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure satisfactory results as judged by Architect. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations, so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy of type expected for Project.

E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on-site and placement in permanent locations.

F. Tools and Equipment: Select tools or equipment that minimize production of excessive noise levels.

G. Templates: Obtain and distribute to the parties involved templates for Work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions with manufacturer.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
2. Allow for building movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

I. Joints: Make joints of uniform width. Where joint locations in exposed Work are not indicated, arrange joints for the best visual effect, as judged by Architect. Fit exposed connections together to form hairline joints.

3.6 CUTTING AND PATCHING

A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

C. Temporary Support: Provide temporary support of Work to be cut.

D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching in accordance with requirements in Section 011000 "Summary."

F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.

G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
6. Proceed with patching after construction operations requiring cutting are complete.

H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as practicable, as judged by Architect. Provide materials and comply with installation

requirements specified in other Sections, where applicable.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

    a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
    b. Restore damaged pipe covering to its original condition.

3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

    a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch, corner to corner of wall and edge to edge of ceiling. Provide additional coats until patch blends with adjacent surfaces.

4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.

I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.7 PROGRESS CLEANING

A. Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above **80 deg F**.
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, in accordance with regulations.

    a. Use containers intended for holding waste materials of type to be stored.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where Work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces in accordance with written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 015000 "Temporary Facilities and Controls."

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.8 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Manufacturer's Field Service: Comply with qualification requirements in Section 014000 "Quality Requirements."

3.9 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.

C. Comply with manufacturer's written instructions for temperature and relative humidity.

3.10 CORRECTION OF THE WORK

A. Repair or remove and replace damaged, defective, or nonconforming Work. Restore damaged substrates and finishes.

1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Repair Work previously completed and subsequently damaged during construction period. Repair to like-new condition.

C. Restore permanent facilities used during construction to their specified condition.

D. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

E. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

F. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 017300

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for Contract closeout, including, but not limited to, the following:

1. Substantial Completion procedures.
2. Final Completion procedures.
3. List of incomplete items.
4. Submittal of Project warranties.
5. Final cleaning.

B. Related Requirements:

1. Section 012900 "Payment Procedures" for requirements for Applications for Payment for Substantial Completion and Final Completion.
2. Section 017823 "Operation and Maintenance Data" for additional operation and maintenance manual requirements.
3. Section 017839 "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
4. Section 017900 "Demonstration and Training" for requirements to train Owner's maintenance personnel to adjust, operate, and maintain products, equipment, and systems.

1.2 DEFINITIONS

A. List of Incomplete Items: Contractor-prepared list of items to be completed or corrected, prepared for the Architect's use prior to Architect's inspection, to determine if the Work is substantially complete.

1.3 ACTION SUBMITTALS

A. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.

1.4 CLOSEOUT SUBMITTALS

A. Certificates of Release: From authorities having jurisdiction.

B. Certificate of Insurance: For continuing coverage.

C. Field Report: For pest-control inspection.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Schedule of Maintenance Material Items: For maintenance material submittal items required by other Sections.

1.6 SUBSTANTIAL COMPLETION PROCEDURES

A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's "punch list"), indicating the value of each item on the list and reasons why the Work is incomplete.

B. Submittals Prior to Substantial Completion: Complete the following a minimum of 5 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction, permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
2. Submit closeout submittals specified in other Division 01 Sections, including Project Record Documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect. Label with manufacturer's name and model number.
5. Submit testing, adjusting, and balancing records.
6. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

C. Procedures Prior to Substantial Completion: Complete the following a minimum of 5 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Advise Owner of pending insurance changeover requirements.
2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
3. Complete startup and testing of systems and equipment.
4. Perform preventive maintenance on equipment used prior to Substantial Completion.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 017900 "Demonstration and Training."
6. Advise Owner of changeover in utility services.
7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.

9. Complete final cleaning requirements.
10. Touch up paint and otherwise repair and restore marred exposed finishes to eliminate visual defects.

D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 5 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

1.7 FINAL COMPLETION PROCEDURES

A. Submittals Prior to Final Completion: Before requesting final inspection for determining Final Completion, complete the following:

1. Submit a final Application for Payment in accordance with Section 012900 "Payment Procedures."
2. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
3. Submit pest-control final inspection report.

B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Architect and Construction Manager will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.8 LIST OF INCOMPLETE ITEMS

A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize list of spaces in sequential order, starting with exterior areas first, listed by room or space number.
2. Organize items applying to each space by major element, including categories for ceilings, individual walls, floors, equipment, and building systems.

3. Submit list of incomplete items in the following format:

    a. PDF Electronic File: Architect will return annotated file.

1.9 SUBMITTAL OF PROJECT WARRANTIES

A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where warranties are indicated to commence on dates other than date of Substantial Completion, or when delay in submittal of warranties might limit Owner's rights under warranty.

B. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.

C. Warranty Electronic File: Provide warranties and bonds in PDF format. Assemble complete warranty and bond submittal package into a single electronic PDF file with bookmarks enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

    1. Submit on digital media acceptable to Architect.

D. Warranties in Paper Form:

    1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive **8-1/2-by-11-inch** paper.
    2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
    3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

E. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:

a. Clean Project site of rubbish, waste material, litter, and other foreign substances.
b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
c. Rake grounds that are not planted, mulched, or paved to a smooth, even-textured surface.
d. Remove tools, construction equipment, machinery, and surplus material from Project site.
e. Remove snow and ice to provide safe access to building.
f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
g. Remove debris and surface dust from limited-access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
h. Clean flooring, removing debris, dirt, and staining; clean in accordance with manufacturer's instructions.
i. Vacuum and mop concrete.
j. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean in accordance with manufacturer's instructions if visible soil or stains remain.
k. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
l. Remove labels that are not permanent.
m. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
n. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
o. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
p. Clean ducts, blowers, and coils if units were operated without filters during

construction or that display contamination with particulate matter on inspection.

q. Clean luminaires, lamps, globes, and reflectors to function with full efficiency.
r. Clean strainers.
s. Leave Project clean and ready for occupancy.

C. Pest Control: Comply with pest control requirements in Section 015000 "Temporary Facilities and Controls." Prepare written report.

D. Construction Waste Disposal: Comply with waste-disposal requirements in Section 015000 "Temporary Facilities and Controls."

3.2 CORRECTION OF THE WORK

A. Complete repair and restoration operations required by "Correction of the Work" Article in Section 017300 "Execution" before requesting inspection for determination of Substantial Completion.

END OF SECTION 017700

SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Administrative and procedural requirements for preparing operation and maintenance manuals, including the following:

1. Operation and maintenance documentation directory manuals.
2. Emergency manuals.
3. Systems and equipment operation manuals.
4. Systems and equipment maintenance manuals.
5. Product maintenance manuals.

B. Related Requirements:

1. Section 013300 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.

1.2 DEFINITIONS

A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.

B. Subsystem: A portion of a system with characteristics similar to a system.

1.3 CLOSEOUT SUBMITTALS

A. Submit operation and maintenance manuals indicated. Provide content for each manual as specified in individual Specification Sections, and as reviewed and approved at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.

B. Format: Submit operation and maintenance manuals in the following format:

1. Submit on digital media acceptable to Architect. Enable reviewer comments on draft submittals.

C. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect will return copy with comments.

D. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

1.4 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

A. Organization of Manuals: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual to contain the following materials, in the order listed:

1. Title page.
2. Table of contents.
3. Manual contents.

B. Title Page: Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.
5. Name and contact information for Contractor.
6. Name and contact information for Architect.
7. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
8. Cross-reference to related systems in other operation and maintenance manuals.

C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

D. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation in accordance with ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

1.5 EMERGENCY MANUALS

A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.

B. Content: Organize manual into a separate section for each of the following:

1. Type of emergency.
2. Emergency instructions.
3. Emergency procedures.

C. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:

1. Fire.

2. Flood.
3. Gas leak.
4. Water leak.
5. Power failure.
6. Water outage.
7. System, subsystem, or equipment failure.

D. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.

E. Emergency Procedures: Include the following, as applicable:

1. Instructions on stopping.
2. Shutdown instructions for each type of emergency.
3. Operating instructions for conditions outside normal operating limits.
4. Required sequences for electric or electronic systems.
5. Special operating instructions and procedures.

1.6 SYSTEMS AND EQUIPMENT OPERATION MANUALS

A. Systems and Equipment Operation Manual: Assemble a complete set of data indicating operation of each system, subsystem, and piece of equipment not part of a system. Include information required for daily operation and management, operating standards, and routine and special operating procedures.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

B. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:

1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
2. Performance and design criteria if Contractor has delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams.
7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

C. Descriptions: Include the following:

1. Product name and model number. Use designations for products indicated on Contract Documents.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

D. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

E. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

F. Piped Systems: Diagram piping as installed, and identify color coding where required for identification.

1.7 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

A. Systems and Equipment Maintenance Manuals: Assemble a complete set of data indicating maintenance of each system, subsystem, and piece of equipment not part of a system. Include manufacturers' maintenance documentation, preventive maintenance procedures and frequency, repair procedures, wiring and systems diagrams, lists of spare parts, and warranty information.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

B. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranties and bonds as described below.

C. Source Information: List each system, subsystem, and piece of equipment included in manual,

identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

D. Manufacturers' Maintenance Documentation: Include the following information for each component part or piece of equipment:

1. Standard maintenance instructions and bulletins; include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

    a. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
3. Identification and nomenclature of parts and components.
4. List of items recommended to be stocked as spare parts.

E. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:

1. Test and inspection instructions.
2. Troubleshooting guide.
3. Precautions against improper maintenance.
4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
5. Aligning, adjusting, and checking instructions.
6. Demonstration and training video recording, if available.

F. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.

1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

G. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

H. Maintenance Service Contracts: Include copies of maintenance agreements with name and

telephone number of service agent.

I. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

1.8 PRODUCT MAINTENANCE MANUALS

A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

B. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

C. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

D. Product Information: Include the following, as applicable:

1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern, and texture.
4. Material and chemical composition.
5. Reordering information for specially manufactured products.

E. Maintenance Procedures: Include manufacturer's written recommendations and the following:

1. Inspection procedures.
2. Types of cleaning agents to be used and methods of cleaning.
3. List of cleaning agents and methods of cleaning detrimental to product.
4. Schedule for routine cleaning and maintenance.
5. Repair instructions.

F. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

G. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF SECTION 017823

SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for Project Record Documents, including the following:

1. Record Drawings.
2. Record specifications.
3. Record Product Data.
4. Miscellaneous record submittals.

B. Related Requirements:

1. Section 017300 "Execution" for final property survey.
2. Section 017700 "Closeout Procedures" for general closeout procedures.
3. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.2 CLOSEOUT SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit one set(s) of marked-up record prints.

B. Record Specifications: Submit annotated PDF electronic files of Project's Specifications, including addenda and Contract modifications.

C. Record Product Data: Submit annotated PDF electronic files and directories of each submittal.

1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit annotated PDF electronic files and directories of each submittal.

1.3 RECORD DRAWINGS

A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.

1. Preparation: Mark record prints to show the actual installation, where installation varies

from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.

a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
b. Accurately record information in an acceptable drawing technique.
c. Record data as soon as possible after obtaining it.
d. Record and check the markup before enclosing concealed installations.
e. Cross-reference record prints to corresponding photographic documentation.

2. Content: Types of items requiring marking include, but are not limited to, the following:

a. Dimensional changes to Drawings.
b. Revisions to details shown on Drawings.
c. Depths of foundations.
d. Locations and depths of underground utilities.
e. Revisions to routing of piping and conduits.
f. Revisions to electrical circuitry.
g. Actual equipment locations.
h. Duct size and routing.
i. Locations of concealed internal utilities.
j. Changes made by Change Order or Construction Change Directive.
k. Changes made following Architect's written orders.
l. Details not on the original Contract Drawings.
m. Field records for variable and concealed conditions.
n. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
4. Mark record prints with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
5. Mark important additional information that was either shown schematically or omitted from original Drawings.
6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

1. Record Prints: Organize record prints into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
2. Format: Annotated PDF electronic file .
3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
4. Identification: As follows:

a. Project name.
b. Date.
c. Designation "PROJECT RECORD DRAWINGS."
d. Name of Architect .
e. Name of Contractor.

1.4 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation, where installation varies from that indicated in Specifications, addenda, and Contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Note related Change Orders , Record Product Data, and Record Drawings where applicable.

B. Format: Submit record specifications as annotated PDF electronic file.

1.5 RECORD PRODUCT DATA

A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and revisions to Project Record Documents as they occur; do not wait until end of Project.

B. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders , Record Specifications, and Record Drawings where applicable.

C. Format: Submit Record Product Data as annotated PDF electronic file.

1.6 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

B. Format: Submit miscellaneous record submittals as PDF electronic file.

1.7 MAINTENANCE OF RECORD DOCUMENTS

A. Maintenance of Record Documents: Store Record Documents in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF SECTION 017839

SECTION 017900 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:

1. Instruction in operation and maintenance of systems, subsystems, and equipment.
2. Demonstration and training video recordings.

1.2 COORDINATION

A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.

B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.

1.3 INSTRUCTION PROGRAM

A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.

B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:

1. Basis of System Design, Operational Requirements, and Criteria: Include the following:

a. System, subsystem, and equipment descriptions.
b. Performance and design criteria if Contractor is delegated design responsibility.
c. Operating standards.
d. Regulatory requirements.
e. Equipment function.
f. Operating characteristics.
g. Limiting conditions.
h. Performance curves.

2. Documentation: Review the following items in detail:

a. Emergency manuals.

b. Systems and equipment operation manuals.
c. Systems and equipment maintenance manuals.
d. Product maintenance manuals.
e. Project Record Documents.
f. Identification systems.
g. Warranties and bonds.
h. Maintenance service agreements and similar continuing commitments.

3. Emergencies: Include the following, as applicable:

a. Instructions on meaning of warnings, trouble indications, and error messages.
b. Instructions on stopping.
c. Shutdown instructions for each type of emergency.
d. Operating instructions for conditions outside of normal operating limits.
e. Sequences for electric or electronic systems.
f. Special operating instructions and procedures.

4. Operations: Include the following, as applicable:

a. Startup procedures.
b. Equipment or system break-in procedures.
c. Routine and normal operating instructions.
d. Regulation and control procedures.
e. Control sequences.
f. Safety procedures.
g. Instructions on stopping.
h. Normal shutdown instructions.
i. Operating procedures for emergencies.
j. Operating procedures for system, subsystem, or equipment failure.
k. Seasonal and weekend operating instructions.
l. Required sequences for electric or electronic systems.
m. Special operating instructions and procedures.

5. Adjustments: Include the following:

a. Alignments.
b. Checking adjustments.
c. Noise and vibration adjustments.
d. Economy and efficiency adjustments.

6. Troubleshooting: Include the following:

a. Diagnostic instructions.
b. Test and inspection procedures.

7. Maintenance: Include the following:

a. Inspection procedures.
b. Types of cleaning agents to be used and methods of cleaning.

c. List of cleaning agents and methods of cleaning detrimental to product.
d. Procedures for routine cleaning.
e. Procedures for preventive maintenance.
f. Procedures for routine maintenance.
g. Instruction on use of special tools.

8. Repairs: Include the following:

a. Diagnosis instructions.
b. Repair instructions.
c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
d. Instructions for identifying parts and components.
e. Review of spare parts needed for operation and maintenance.

1.4 PREPARATION

A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 017823 "Operation and Maintenance Data."

1.5 INSTRUCTION

A. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

1. Owner will furnish Contractor with names and positions of participants.

B. Scheduling: Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.

1. Schedule training with Owner with at least seven days' advance notice.

C. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF SECTION 017900

SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. The Work of this Section Includes:

1. Demolition and removal of selected portions of exterior or interior of building or structure and site elements.
2. Removal and salvage of existing items for delivery to Owner and removal of existing items for reinstallation.

B. Related Requirements:

1. Section 011000 "Summary" for restrictions on use of the premises, Owner-occupancy requirements, and phasing requirements.
2. Section 017300 "Execution" for cutting and patching procedures.
3. Section 013516 "Alteration Project Procedures" for general protection and work procedures for alteration projects.
4. Section 311000 "Site Clearing" for site clearing and removal of above- and below-grade improvements not part of selective demolition.
5. Section 330500 "Common Work Results for Utilities" for removal of site utility systems piping, equipment, and components.

1.2 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of off-site unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to Owner as indicated.

C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage; prepare for reuse; and reinstall where indicated.

D. Existing to Remain: Existing items of construction that are not to be removed.

1.3 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.4 COORDINATION

A. Arrange selective demolition schedule so as not to interfere with Owner's operations.

1.5 PREINSTALLATION MEETINGS

A. Predemolition Conference: Conduct conference at Project site.

1. Inspect and discuss condition of construction to be selectively demolished.
2. Review structural load limitations of existing structure.
3. Review and finalize selective demolition schedule and verify availability of demolition personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
5. Review areas where existing construction is to remain and requires protection.
6. Review and finalize protection requirements.
7. Review procedures for noise control and dust control.
8. Review storage, protection, and accounting for items to be removed for salvage or reinstallation.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Statements: For refrigerant recovery technician.

B. Schedule of Selective Demolition Activities: Indicate the following:

1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
2. Temporary interruption of utility services. Indicate how long utility services will be interrupted.
3. Coordination for shutoff, capping, and continuation of utility services.
4. Use of elevator and stairs.
5. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.

C. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed in accordance with EPA regulations. Include name and address of technician and date refrigerant was recovered.

D. Warranties: Documentation indicating that existing warranties are still in effect after completion of selective demolition.

1.7 FIELD CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

1. Before selective demolition, Owner will remove the following items:

a. Toilets.
b. Interior Doors to existing offices.
c. Vanities in Ground Floor Restrooms.
d. Mirrors in Ground Floor Restrooms.

C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials:

1. It is not expected that hazardous materials will be encountered in the Work.

a. Hazardous materials will be removed by Owner before start of the Work.
b. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

E. On-site sale of removed items or materials is not permitted.

1.8 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials and using approved contractors so as not to void existing warranties. Notify warrantor before proceeding. Existing warranties include the following:

1. Roofing.

B. Notify warrantor on completion of selective demolition, and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before

beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI/ASSP A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.

C. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.

1. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

D. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs or video . Comply with Section 013233 "Photographic Documentation."

1. Inventory and record the condition of items to be removed for salvage or reinstallation. Photograph or video conditions that might be misconstrued as damage caused by removal.
2. Photograph or video existing conditions of adjoining construction including finish surfaces, that might be misconstrued as damage caused by selective demolition operations or removal of items for salvage or reinstallation.

3.2 PREPARATION

A. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

1. Strengthen or add new supports when required during progress of selective demolition.

B. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.

2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
4. Cover and protect furniture, furnishings, and equipment that have not been removed.
5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 015000 "Temporary Facilities and Controls."

C. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location and reinstalled in their original locations after selective demolition operations are complete.

D. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment in accordance with 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 UTILITY SERVICES AND BUILDING SYSTEMS

A. Existing Services/Systems to Remain: Maintain utilities and building systems and equipment to remain and protect against damage during selective demolition operations.

1. Maintain fire-protection facilities in service during selective demolition operations.

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utilities and building systems serving areas to be selectively demolished.

1. Owner will arrange to shut off indicated utilities when requested by Contractor.
2. If disconnection of utilities and building systems will affect adjacent occupied parts of the building, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to those parts of the building.
3. Demolish and remove existing building systems, equipment, and components indicated on Drawings to be removed.

    a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
    b. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
    c. Equipment to Be Removed: Disconnect and cap services and remove equipment and components.

4. Abandon existing building systems, equipment, and components indicated on Drawings to be abandoned in place.

    a. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.

b. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material and leave in place.

5. Remove and reinstall/salvage existing building systems, equipment, and components indicated on drawings to be removed and reinstalled or removed and salvaged:

a. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment and components; when appropriate, reinstall, reconnect, and make equipment operational.
b. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and components and deliver to Owner.

3.4 SALVAGE/REINSTALL

A. Removed and Salvaged Items:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
3. Store items in a secure area until delivery to Owner.
4. Protect items from damage during transport and storage.

B. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

3.5 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
4. Do not use cutting torches until work area is cleared of flammable materials. At

concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.

5. Maintain fire watch during and for at least 24 hours after flame-cutting operations.
6. Maintain adequate ventilation when using cutting torches.
7. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
8. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
9. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed trafficways if required by authorities having jurisdiction.
2. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

3.6 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Concrete:

1. Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.

B. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.

C. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, and then break up and remove.

D. Resilient Floor Coverings: Remove floor coverings and adhesive in accordance with recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings."

E. Roofing: Remove no more existing roofing than what can be covered in one day by new roofing and so that building interior remains watertight and weathertight. See Section 073113 " Asphalt Shingles " for new roofing requirements.

1. Remove existing roof membrane, flashings, copings, and roof accessories.
2. Remove existing roofing system down to substrate.

3.7 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn demolished materials.

3.8 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies cast-in place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:

1. Footings.
2. Foundation walls.
3. Slabs-on-grade.
4. Suspended slabs.
5. Building walls.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1. Indicate amounts of mixing water to be withheld for later addition at Project site.

C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and

laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

D. Welding certificates.

E. Qualification Data: For Installer ,manufacturer and testing agency.

F. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:

1. Aggregates. Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.

G. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
2. Admixtures.
3. Form materials and form-release agents.
4. Steel reinforcement and accessories.
5. Waterstops.
6. Curing compounds.
7. Floor and slab treatments.
8. Bonding agents.
9. Adhesives.
10. Vapor retarders.
11. Semirigid joint filler.
12. Joint-filler strips.
13. Repair materials.

H. Field quality-control test and inspection reports.

I. Minutes of preinstallation conference.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

B. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single manufacturer.

C. Welding: Qualify procedures and personnel according to AWS D1.4, "Structural Welding Code--Reinforcing Steel."

D. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301, "Specification for Structural Concrete," Sections 1 through 5.

E. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

F. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:

a. Contractor's superintendent.
b. Independent testing agency responsible for concrete design mixtures.
c. Ready-mix concrete manufacturer.
d. Concrete subcontractor.

2. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold- and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, semirigid joint fillers, forms and form removal limitations, vapor-retarder installation, anchor rod and anchorage device installation tolerances, steel reinforcement installation, floor and slab flatness and levelness measurement, concrete repair procedures, and concrete protection.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

2.2 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

1. Plywood, metal, or other approved panel materials.

B. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.

C. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.

D. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

E. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

1. Furnish units that will leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.
2. Furnish ties that, when removed, will leave holes no larger than 1 inch in diameter in concrete surface.
3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

2.3 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.

B. Plain-Steel Welded Wire Reinforcement: ASTM A 185, plain, fabricated from as-drawn steel wire into flat sheets.

C. Deformed-Steel Welded Wire Reinforcement: ASTM A 497, flat sheet.

2.4 REINFORCEMENT ACCESSORIES

A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60, plain-steel bars, cut bars true to length with ends square and free of burrs.

B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:

1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

2.5 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:

1. Portland Cement: ASTM C 150, Type I/II, grey. Supplement with the following:

a. Fly Ash: ASTM C 618, Class [**C**] [**F**].
b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.

2. Blended Hydraulic Cement: ASTM C 595, Type IS, portland blast-furnace slag cement.

B. Silica Fume: ASTM C 1240, amorphous silica.

C. Normal-Weight Aggregates: ASTM C 33, Class 3M coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 10 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.

1. Maximum Coarse-Aggregate Size: 1 inch nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

D. Water: ASTM C 94/C 94M and potable.

2.6 ADMIXTURES

A. Air-Entraining Admixture: ASTM C 260.

B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

C. Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete and complying with ASTM C 494/C 494M, Type C.

1. Available Products:

a. Boral Material Technologies, Inc.; Boral BCN.
b. Euclid Chemical Company (The); Eucon CIA.
c. Grace Construction Products, W. R. Grace & Co.; DCI.
d. Master Builders, Inc.; Rheocrete CNI.
e. Sika Corporation; Sika CNI.

D. Non-Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, non-set-accelerating, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete.

1. Available Products:

a. Axim Concrete Technologies; Catexol 1000CI.
b. Boral Material Technologies, Inc.; Boral BCN2.
c. Cortec Corporation; MCI 2000.
d. Grace Construction Products, W. R. Grace & Co.; DCI-S.
e. Master Builders, Inc.; Rheocrete 222+.
f. Sika Corporation; FerroGard-901.

2.7 WATERSTOPS

A. Flexible Rubber Waterstops: CE CRD-C 513, with factory-installed metal eyelets, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.

1. Available Manufacturers:

    a. Greenstreak.
    b. Progress Unlimited, Inc.
    c. Williams Products, Inc.

2. Profile: Flat, dumbbell with center bulb.
3. Dimensions: 6 inches by 3/8 inch thick ; nontapered.

2.8 VAPOR RETARDERS

A. Plastic Vapor Retarder: ASTM E 1745, Class C, or polyethylene sheet, ASTM D 4397, not less than 10 mils thick. Include manufacturer's recommended adhesive or pressure-sensitive joint tape.

1. Available Products:

    a. Fortifiber Corporation; Moistop Plus.
    b. Raven Industries Inc.; Dura Skrim 6.
    c. Reef Industries, Inc.; Griffolyn Type-65.
    d. Stego Industries, LLC; Stego Wrap, 10 mils.

2.9 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

1. Available Products:

    a. Axim Concrete Technologies; Cimfilm.
    b. Burke by Edoco; BurkeFilm.
    c. ChemMasters; Spray-Film.
    d. Conspec Marketing & Manufacturing Co., Inc., a Dayton Superior Company; Aquafilm.
    e. Dayton Superior Corporation; Sure Film.
    f. Euclid Chemical Company (The); Eucobar.
    g. Kaufman Products, Inc.; Vapor Aid.
    h. Lambert Corporation; Lambco Skin.
    i. L&M Construction Chemicals, Inc.; E-Con.
    j. MBT Protection and Repair, Div. of ChemRex; Confilm.
    k. Meadows, W. R., Inc.; Sealtight Evapre.
    l. Metalcrete Industries; Waterhold.
    m. Nox-Crete Products Group, Kinsman Corporation; Monofilm.
    n. Sika Corporation, Inc.; SikaFilm.
    o. Symons Corporation, a Dayton Superior Company; Finishing Aid.

p. Unitex; Pro-Film.
q. US Mix Products Company; US Spec Monofilm ER.
r. Vexcon Chemicals, Inc.; Certi-Vex EnvioAssist.

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 C 171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

1. Available Products:

a. Anti-Hydro International, Inc.; AH Curing Compound #2 DR WB.
b. Burke by Edoco; Aqua Resin Cure.
c. ChemMasters; Safe-Cure Clear.
d. Conspec Marketing & Manufacturing Co., Inc., a Dayton Superior Company; W.B. Resin Cure.
e. Dayton Superior Corporation; Day Chem Rez Cure (J-11-W).
f. Euclid Chemical Company (The); Kurez DR VOX.
g. Kaufman Products, Inc.; Thinfilm 420.
h. Lambert Corporation; Aqua Kure-Clear.
i. L&M Construction Chemicals, Inc.; L&M Cure R.
j. Meadows, W. R., Inc.; 1100 Clear.
k. Nox-Crete Products Group, Kinsman Corporation; Resin Cure E.
l. Symons Corporation, a Dayton Superior Company; Resi-Chem Clear Cure.
m. Tamms Industries, Inc.; Horncure WB 30.
n. Unitex; Hydro Cure 309.
o. US Mix Products Company; US Spec Maxcure Resin Clear.
p. Vexcon Chemicals, Inc.; Certi-Vex Enviocure 100.

F. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, nondissipating, certified by curing compound manufacturer to not interfere with bonding of floor covering.

1. Available Products:

a. Anti-Hydro International, Inc.; AH Clear Cure WB.
b. Burke by Edoco; Spartan Cote WB II.
c. ChemMasters; Safe-Cure & Seal 20.

d. Conspec Marketing & Manufacturing Co., Inc., a Dayton Superior Company; Cure and Seal WB.
e. Dayton Superior Corporation; Safe Cure and Seal (J-18).
f. Euclid Chemical Company (The); Aqua Cure VOX.
g. Kaufman Products, Inc.; Cure & Seal 309 Emulsion.
h. Lambert Corporation; Glazecote Sealer-20.
i. L&M Construction Chemicals, Inc.; Dress & Seal WB.
j. Meadows, W. R., Inc.; Vocomp-20.
k. Metalcrete Industries; Metcure.
l. Nox-Crete Products Group, Kinsman Corporation; Cure & Seal 150E.
m. Symons Corporation, a Dayton Superior Company; Cure & Seal 18 Percent E.
n. Tamms Industries, Inc.; Clearseal WB 150.
o. Unitex; Hydro Seal.
p. US Mix Products Company; US Spec Hydrasheen 15 percent
q. Vexcon Chemicals, Inc.; Starseal 309.

G. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, 18 to 25 percent solids, nondissipating, certified by curing compound manufacturer to not interfere with bonding of floor covering.

1. Available Products:

a. Burke by Edoco; Spartan Cote WB II 20 Percent.
b. ChemMasters; Safe-Cure Clear.
c. Conspec Marketing & Manufacturing Co., Inc., a Dayton Superior Company; High Seal.
d. Dayton Superior Corporation; Safe Cure and Seal (J-19).
e. Euclid Chemical Company (The); Diamond Clear VOX.
f. Kaufman Products, Inc.; SureCure Emulsion.
g. Lambert Corporation; Glazecote Sealer-20.
h. L&M Construction Chemicals, Inc.; Dress & Seal WB.
i. MBT Protection and Repair, Div. of ChemRex; MasterKure-N-Seal VOC.
j. Meadows, W. R., Inc.; Vocomp-20.
k. Metalcrete Industries; Metcure 0800.
l. Nox-Crete Products Group, Kinsman Corporation; Cure & Seal 200E.
m. Sonneborn, Div. of ChemRex; Kure-N-Seal.
n. Symons Corporation, a Dayton Superior Company; Cure & Seal 18 Percent E.
o. Tamms Industries, Inc.; Clearseal WB STD.
p. Unitex; Hydro Seal 18.
q. US Mix Products Company; US Spec Radiance UV-25
r. Vexcon Chemicals, Inc.; Starseal 0800.

H. Clear, Solvent-Borne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

1. Available Products:

a. Burke by Edoco; Cureseal 1315.
b. ChemMasters; Spray-Cure & Seal Plus.
c. Conspec Marketing & Manufacturing Co., Inc., a Dayton Superior Company; Sealcure 1315.
d. Dayton Superior Corporation; Day-Chem Cure and Seal (J-22UV).
e. Euclid Chemical Company (The); Super Diamond Clear.
f. Kaufman Products, Inc.; Sure Cure 25.
g. Lambert Corporation; UV Super Seal.
h. L&M Construction Chemicals, Inc.; Lumiseal Plus.
i. Meadows, W. R., Inc.; CS-309/30.
j. Metalcrete Industries; Seal N Kure 0.
k. Sonneborn, Div. of ChemRex; Kure-N-Seal 5.
l. Tamms Industries, Inc.; LusterSeal 300.
m. Unitex; Solvent Seal 1315.
n. US Mix Products Company; US Spec CS-25
o. Vexcon Chemicals, Inc.; Certi-Vex AC 1315

I. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

1. Available Products:

a. Burke by Edoco; Cureseal 1315 WB.
b. ChemMasters; Polyseal WB.
c. Conspec Marketing & Manufacturing Co., Inc., a Dayton Superior Company; Sealcure 1315 WB.
d. Euclid Chemical Company (The); Super Diamond Clear VOX.
e. Kaufman Products, Inc.; Sure Cure 25 Emulsion.
f. Lambert Corporation; UV Safe Seal.
g. L&M Construction Chemicals, Inc.; Lumiseal WB Plus.
h. Meadows, W. R., Inc.; Vocomp-30.
i. Metalcrete Industries; Metcure 30.
j. Symons Corporation, a Dayton Superior Company; Cure & Seal 31 Percent E.
k. Tamms Industries, Inc.; LusterSeal WB 300.
l. Unitex; Hydro Seal 25.
m. US Mix Products Company; US Spec Radiance UV-25.
n. Vexcon Chemicals, Inc.; Vexcon Starseal 1315.

2.10 RELATED MATERIALS

A. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80 per ASTM D 2240.

B. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

C. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:

1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

D. Reglets: Fabricate reglets of not less than 0.0217-inch- thick, galvanized steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.

E. Dovetail Anchor Slots: Hot-dip galvanized steel sheet, not less than 0.0336 inch thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.

F. Acoustic Joint Filler: Resilient non-extruding premolded bituminous impregnated, as specific in Section 03300 - Concrete

2.11 REPAIR MATERIALS

A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.

1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by underlayment manufacturer.
4. Compressive Strength: Not less than 4100 psi at 28 days when tested according to ASTM C 109/C 109M.

B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.

1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.

2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
4. Compressive Strength: Not less than 5000 psi at 28 days when tested according to ASTM C 109/C 109M.

2.12 CONCRETE MIXTURES, GENERAL

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, according to ACI 301.

1. Use a qualified independent 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 cement in concrete as follows:

1. Fly Ash: 25 percent.
2. Combined Fly Ash and Pozzolan: 25 percent.
3. Ground Granulated Blast-Furnace Slag: 50 percent.
4. Combined Fly Ash or Pozzolan and Ground Granulated Blast-Furnace Slag: 50 percent portland cement minimum, with fly ash or pozzolan not exceeding 25 percent.
5. Silica Fume: 10 percent.
6. Combined Fly Ash, Pozzolans, and Silica Fume: 35 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.
7. Combined Fly Ash or Pozzolans, Ground Granulated Blast-Furnace Slag, and Silica Fume: 50 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.

C. Limit water-soluble, chloride-ion content in hardened concrete to 0.06 percent by weight of cement.

D. Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.

2.13 CONCRETE MIXTURES FOR BUILDING ELEMENTS

A. Footings: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: as indicated at 28 days.
2. Maximum Water-Cementitious Materials Ratio: as indicated.
3. Slump Limit: as indicated
4. Air Content: as indicated

B. Foundation Walls: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: as indicated at 28 days.
2. Maximum Water-Cementitious Materials Ratio: as indicated.
3. Slump Limit: as indicated
4. Air Content: as indicated

C. Slabs-on-Grade: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: as indicated at 28 days.
2. Minimum Cementitious Materials Content: as indicated.
3. Slump Limit: as indicated.
4. Air Content: as indicated
5. Air Content: Do not allow air content of troweled finished floors to exceed 3 percent.

D. Suspended Slabs: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: as indicated at 28 days.
2. Minimum Cementitious Materials Content: as indicated.
3. Slump Limit: as indicated.
4. Air Content: as indicated
5. Air Content: Do not allow air content of troweled finished floors to exceed 3 percent.

2.14 FABRICATING REINFORCEMENT

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

2.15 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.

1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. 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 5 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

3.1 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:

1. Class A, 1/8 inch for smooth-formed finished surfaces.

D. Construct forms tight enough to prevent loss of concrete mortar.

E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.

1. Install keyways, reglets, recesses, and the like, for easy removal.
2. Do not use rust-stained steel form-facing material.

F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and

secure units to support screed strips; use strike-off templates or compacting-type screeds.

G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

H. Chamfer exterior corners and edges of permanently exposed concrete.

I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 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. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."
2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
3. Install dovetail anchor slots in concrete structures as indicated.

3.3 REMOVING AND REUSING FORMS

A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete, if concrete is hard enough to not be damaged by form-removal operations and curing and protection operations are maintained.

1. Leave formwork for beam soffits, joists, slabs, and other structural elements that supports weight of concrete in place until concrete has achieved at least 70 percent of its 28-day design compressive strength.
2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.

B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.4 VAPOR RETARDERS

A. Plastic Vapor Retarders: Place, protect, and repair vapor retarders according to ASTM E 1643 and manufacturer's written instructions.

1. Lap joints 6 inches and seal with manufacturer's recommended tape.

3.5 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

1. Do not cut or puncture vapor retarder. 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 would reduce bond to concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.6 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. 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. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
2. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
3. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
4. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
5. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

D. Isolation Joints in Slabs-on-Grade: 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.
2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface where joint sealants, specified in Division 7 Section "Joint Sealants," are indicated.

3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

3.7 ACOUSTIC ISOLATION JOINTS

1. Joints shall be installed where indicated on plans and are detailed as follows:

2. General: Acoustical joints in concrete walls, slabs, and columns shall be a clear 2 inch gap between faces of adjacent concrete structures. The intent is to interrupt transmission vibration through the structure. Two layers of 1 inch polystyrene shall be installed as permanent form work between the two concrete structures; butt joints between ends of polystyrene boards shall be staggered so as to prevent concrete bridging the joints. Polystyrene strip width shall be 2 inches greater that the depth of the joint; strip shall extend 1 inch to each side of the faces of the concrete during pouring and curing to avoid concrete bridging the joints. All joints in the polystyrene shall be staggered and covered with duct tape. After installation, cover isolation joints with duct tape to prevent debris from accumulating in the joint until the sealant or joint cover is installed. No mortar, masonry, concrete, steel framing, rebar, wood, or other rigid material shall bridge across an acoustical joint.

3. Additional instructions for joints in grade slabs: prior to pouring the second side of the joint, place a polyethylene sheet along the vertical face of the joint approximately 12 inches under the slab to prevent concrete seepage under the joint. After curing, trim back excess joint filler. Cover joint with duct tape to prevent debris from accumulating in the joint until the sealant or join cover is installed.

4. Additional instructions for joints in suspended slabs: When a joint is cast between two upper level slabs or between an upper level slab and a beam or column, follow the above general measures and then the following: immediately after the work is removed, inspect the joint from above and below for bridging, and chip out all excess concrete. Where the slab will abut a wall or steel structure (to be installed later), dimension the slab to leave a 2 inch gap when the wall is built. After the wall or beam is in place pack the 2 inch joint with fiberglass and seal both sides with appropriate sealant on foam backer rod.

5. Slab on metal deck: Leave a 1 inch clear gap between the steel edge and adjacent construction. Pack the joint with fiberglass and sealed both sides with appropriate sealant on backer rod.

3.8 WATERSTOPS

A. Flexible Waterstops: Install in construction joints and at other joints indicated to form a continuous diaphragm. Install in longest lengths practicable. Support and protect exposed waterstops during progress of the Work. Field fabricate joints in waterstops according to manufacturer's written instructions.

3.9 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.

1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

C. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.

1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

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.

1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
2. Maintain reinforcement in position on chairs during concrete placement.

3. Screed slab surfaces with a straightedge and strike off to correct elevations.
4. Slope surfaces uniformly to drains where required.
5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

E. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

F. Hot-Weather Placement: Comply with ACI 301 and as follows:

1. Maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.10 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces not exposed to public view.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces exposed to public view, to receive a rubbed finish, to be covered with a coating or covering material applied directly to concrete.

C. Rubbed Finish: Apply the following to smooth-formed finished as-cast concrete where indicated:

1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
2. Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix one part portland cement to one and one-half parts fine sand with a 1:1 mixture of bonding admixture and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.
3. Cork-Floated Finish: Wet concrete surfaces and apply a stiff grout. Mix one part portland cement and one part fine sand with a 1:1 mixture of bonding agent and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Compress grout into voids by grinding surface. In a swirling motion, finish surface with a cork float.

D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.11 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of 1/4 inch in 1 direction.

1. Apply scratch finish to surfaces indicated and to receive mortar setting beds for bonded cementitious floor finishes.

C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.

1. Apply float finish to surfaces indicated.

D. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

1. 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.

2. Finish and measure surface so gap at any point between concrete surface and an unleveled, freestanding, 10-foot- long straightedge resting on 2 high spots and placed anywhere on the surface does not exceed 3/16 inch

E. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces where ceramic or quarry tile is to be installed by either thickset or thin-set method. While concrete is still plastic, slightly scarify surface with a fine broom.

1. Comply with flatness and levelness tolerances for trowel finished floor surfaces.

F. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.

1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

G. Slip-Resistive Finish: Before final floating, apply slip-resistive aggregate finish where indicated and to concrete stair treads, platforms, and ramps. Apply according to manufacturer's written instructions and as follows:

1. Uniformly spread 25 lb/100 sq. ft. of dampened slip-resistive aggregate over surface in 1 or 2 applications. Tamp aggregate flush with surface, but do not force below surface.
2. After broadcasting and tamping, apply float finish.
3. After curing, lightly work surface with a steel wire brush or an abrasive stone and water to expose slip-resistive aggregate.

3.12 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. 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 steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.

D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in inserts and accessories as shown on Drawings. Screed, tamp, and trowel-finish concrete surfaces.

3.13 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.

D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.

E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

a. Water.
b. Continuous water-fog spray.
c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

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. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

   a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
   b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
   c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project..

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

   a. After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on Project.

4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.14 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.

1. Defer joint filling until concrete has aged at least one month(s). Do not fill joints until construction traffic has permanently ceased.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.15 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half 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, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, 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 in any dimension in solid concrete, but not less than 1 inch in depth. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. 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 will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
2. After concrete has cured at least 14 days, correct high areas by grinding.
3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. 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.

3.16 FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Testing and Inspecting: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

C. Inspections:

1. Steel reinforcement placement.
2. Headed bolts and studs.
3. Verification of use of required design mixture.
4. Concrete placement, including conveying and depositing.
5. Curing procedures and maintenance of curing temperature.
6. Verification of concrete strength before removal of shores and forms from beams and slabs.

D. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
1. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. or fraction thereof of each concrete mixture placed each day.

    a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
3. Air Content: ASTM C 231, pressure method, for normal-weight concrete;one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.
5. Compression Test Specimens: ASTM C 31/C 31M.

    a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.

6. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.
    a. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
7. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds

specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

8. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
9. 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.
10. Additional Tests: Testing and inspecting agency shall 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. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
11. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
12. Correct deficiencies in the Work that test reports and inspections indicate dos not comply with the Contract Documents.

END OF SECTION 03300

SECTION 035416 - HYDRAULIC CEMENT UNDERLAYMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Polymer-modified, self-leveling, hydraulic cement underlayment for application below interior floor coverings.

1.2 ACTION SUBMITTALS

A. Product Data: For the following:

1. Hydraulic cement underlayment.
2. Primer.
3. Corrosion-resistant coating.
4. Surface sealer.

1.3 FIELD CONDITIONS

A. Environmental Limitations: Comply with manufacturer's written instructions for substrate temperature, ventilation, ambient temperature and humidity, and other conditions affecting underlayment performance.

1. Place hydraulic cement underlayments only when ambient temperature and temperature of substrates are between **50 and 80 deg F**.

PART 2 - PRODUCTS

2.1 HYDRAULIC CEMENT UNDERLAYMENTS

A. Hydraulic Cement Underlayment: Polymer-modified, self-leveling, hydraulic cement product that can be applied in minimum uniform thickness of **1/4 inch** and that can be feathered at edges to match adjacent floor elevations.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. ARDEX Americas
b. KOSTER American Corporation
c. MAPEI Corporation

d. Schonox HPS North America, Inc.
e. Uzin Utz North America, Inc.

2. Cement Binder: ASTM C150/C150M, portland cement, or hydraulic or blended hydraulic cement as defined by ASTM C219.
3. Compressive Strength: Not less than 3500 psi at 28 days when tested according to ASTM C109/C109M.
4. Underlayment Additive: Resilient-emulsion product of underlayment manufacturer, formulated for use with underlayment when applied to substrate and conditions indicated.

B. Aggregate: Well-graded, washed gravel, **1/8 to 1/4 inch**; or coarse sand as recommended by underlayment manufacturer.

1. Provide aggregate when recommended in writing by underlayment manufacturer for underlayment thickness required.

C. Water: Potable and at a temperature of not more than **70 deg F**.

D. Primer: Product of underlayment manufacturer recommended in writing for substrate, conditions, and application indicated.

E. Corrosion-Resistant Coating: Recommended in writing by underlayment manufacturer for metal substrates.

F. Surface Sealer: Designed to reduce porosity as recommended by manufacturer for type of floor covering to be applied to underlayment.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for conditions affecting performance of the Work.

B. Proceed with application only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare and clean substrate according to manufacturer's written instructions.

1. Treat nonmoving substrate cracks according to manufacturer's written instructions to prevent cracks from telegraphing (reflecting) through underlayment.
2. Fill substrate voids to prevent underlayment from leaking.

B. Concrete Substrates: Mechanically remove, according to manufacturer's written instructions, laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants that might impair underlayment bond.

1. Moisture Testing: Perform tests so that each test area does not exceed 1000 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.

    a. Anhydrous Calcium Chloride Test, ASTM F1869: Proceed with installation only after substrates do not exceed a maximum moisture-vapor-emission rate of as recommended by adhesive manufacturer in 24 hours.
    b. Relative Humidity Test: Using in situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum 60% percent relative humidity level measurement, or as recommended by hydraulic cement underlayment manufacturer.

C. Metal Substrates: Mechanically remove, according to manufacturer's written instructions, rust, foreign matter, and other contaminants that might impair underlayment bond. Apply corrosion-resistant coating compatible with underlayment if recommended in writing by underlayment manufacturer.

D. Adhesion Tests: After substrate preparation, test substrate for adhesion with underlayment according to manufacturer's written instructions.

3.3 INSTALLATION

A. Mix and install underlayment components according to manufacturer's written instructions.

1. Close areas to traffic during underlayment installation and for time period after installation recommended in writing by manufacturer.
2. Coordinate installation of components to provide optimum adhesion to substrate and between coats.
3. At substrate expansion, isolation, and other moving joints, allow joint of same width to continue through underlayment.

B. Apply primer over prepared substrate at manufacturer's recommended spreading rate.

C. Install underlayment to produce uniform, level surface.

1. If aggregate is required for thickness required to achieve level floor, Install a final layer without aggregate to product surface.
2. Feather edges to match adjacent floor elevations.

D. Cure underlayment according to manufacturer's written instructions. Prevent contamination during installation and curing processes.

E. Do not install floor coverings over underlayment until after time period recommended in writing by underlayment manufacturer.

F. If required, Apply surface sealer at rate recommended by manufacturer.

G. Remove and replace underlayment areas that evidence lack of bond with substrate, including

areas that emit a "hollow" sound when tapped.

3.4 INSTALLATION TOLERANCES

A. Finish and measure surface, so gap at any point between hydraulic cement underlayment surface and an unleveled, freestanding, 10-foot- long straightedge resting on two high spots and placed anywhere on the surface does not exceed 3/16 inch.

3.5 PROTECTION

A. Protect underlayment from concentrated and rolling loads for remainder of construction period.

END OF SECTION 035416

SECTION 042000 - UNIT MASONRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concrete masonry units.
2. Lintels.
3. Brick.
4. Mortar and grout materials.
5. Reinforcement.
6. Embedded flashing.
7. Accessories.
8. Mortar and grout mixes.

B. Products Installed but not Furnished under This Section:

1. Steel lintels in unit masonry.
2. Steel shelf angles for supporting unit masonry.
3. Cavity wall insulation adhered to masonry backup.

C. Related Requirements:

1. Section 014339 "Mockups" for integrated exterior mockup requirements.
2. Section 071900 "Water Repellents" for water repellents applied to unit masonry assemblies.
3. Section 072100 "Thermal Insulation" for cavity wall insulation.

1.2 ALLOWANCES

A. See Section 012100 "Allowances" for description of allowances affecting items specified in this Section.

1.3 DEFINITIONS

A. CMU(s): Concrete masonry unit(s).

B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples for Initial Selection:

1. Clay face brick, in the form of straps of five or more bricks.
2. Colored mortar.
3. Weep/cavity vents.

1.5 INFORMATIONAL SUBMITTALS

1.6 MOCKUPS

A. Sample Panel Mockups: Build sample panels to verify selections made under Sample submittals and to demonstrate aesthetic effects. Comply with requirements in Section 014000 "Quality Requirements" for mockups.

1. Build sample panels for each type of exposed unit masonry construction in sizes approximately 48 inches long by 48 inches high by full thickness.
2. Build sample panels facing south.
3. Where masonry is to match existing, build panels adjacent and parallel to existing surface.
4. Clean one-half of exposed faces of panels with masonry cleaner indicated.
5. Protect approved sample panels from the elements with weather-resistant membrane.
6. Approval of sample panels is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; aesthetic qualities of workmanship; and other material and construction qualities specifically approved by Architect in writing.

    a. Approval of sample panels does not constitute approval of deviations from the Contract Documents contained in sample panels unless Architect specifically approves such deviations in writing.

B. Wall Mockups: Build mockups to set quality standards for materials and execution. See Section 014339 "Mockups" for additional construction requirements for integrated exterior mockups.

1. Build mockups for typical exterior wall in sizes approximately 48 inches long by 48 inches high by full thickness, including face and backup wythes and accessories.

    a. Include a sealant-filled joint at least **16 inches** long in exterior wall mockup.
    b. Include lower corner of window opening at upper corner of exterior wall mockup. Make opening approximately **12 inches** wide by **16 inches** high.
    c. Include through-wall flashing installed for a **24-inch** length in corner of exterior wall mockup approximately **16 inches** down from top of mockup, with a **12-inch** length of flashing left exposed to view (omit masonry above half of flashing).
    d. Include studs, sheathing, water-resistive barrier, veneer anchors, flashing, cavity drainage material, and weep holes in exterior masonry-veneer wall mockup.

2. Where masonry is to match existing, erect mockups adjacent and parallel to existing surface.
3. Clean one-half of exposed faces of mockups with masonry cleaner as indicated.

4. Protect accepted mockups from the elements with weather-resistant membrane.
5. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations by Change Order.
6. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

D. Deliver preblended, dry mortar mix in moisture-resistant containers. Store preblended, dry mortar mix in delivery containers on elevated platforms in a dry location or in covered weatherproof dispensing silos.

E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.8 FIELD CONDITIONS

A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.

1. Extend cover a minimum of **24 inches** down both sides of walls, and hold cover securely in place.
2. Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of **24 inches** down face next to unconstructed wythe, and hold cover in place.

B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after building masonry walls or columns.

C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.

1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.

2. Protect sills, ledges, and projections from mortar droppings.
3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.

D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602.

1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is **40 deg F** and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.

E. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. For exposed masonry units and cementitious mortar components, obtain each color and grade from single source with resources to provide materials of consistent quality in appearance and physical properties.

2.2 UNIT MASONRY, GENERAL

A. Masonry Standard: Comply with TMS 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 and will be within 20 ft. vertically and horizontally of a walking surface.

2.3 CONCRETE MASONRY UNITS

A. 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.

B. CMUs: ASTM C90, lightweight.

1. Size (Width): Manufactured to dimensions **3/8 inch** less than nominal dimensions.

C. Concrete Building Brick: ASTM C55, lightweight.

2.4 LINTELS

A. 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. Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.

B. Offset Angle Supports: Steel plate brackets anchored to structure, allowing continuous insulation behind shelf angle supporting veneer. Component and anchor size and spacing engineered by manufacturer.

1. Stainless Steel: ASTM A240/A240M or ASTM A666, Type 304.

2.5 BRICK

A. General: Provide shapes indicated and as follows, with exposed surfaces matching finish and color of exposed faces of adjacent units:

1. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.
2. Provide special shapes for applications requiring brick of size, form, color, and texture on exposed surfaces that cannot be produced by sawing.

B. Clay Face Brick: Facing brick complying with ASTM C216, Grade MW or Grade SW, Type FBS.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

a. Acme Brick Company
b. Belden Brick Company (The)
c. Boral Bricks, Inc; Boral Limited
d. Endicott Clay Products Co
e. General Shale, Inc.
f. Glen-Gery Corporation

2. Initial Rate of Absorption: Less than **30 g/30 sq. in.** per minute when tested in accordance with ASTM C67/C67M.
3. Efflorescence: Provide brick that has been tested in accordance with ASTM C67/C67M and is rated "not effloresced."
4. Size (Actual Dimensions): 3-5/8 inches wide by 2-1/4 inches high by 7-5/8 inches long.
5. Color and Texture: light-colored brick with color and texture to approximately match painted brick of existing building.

2.6 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.

1. Alkali content will not be more than 0.1 percent when tested in accordance with ASTM C114.

B. Hydrated Lime: ASTM C207, Type S.

C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.

D. Masonry Cement: ASTM C91/C91M.

E. Colored Cement Products: Packaged blend made from portland cement and hydrated lime and mortar pigments, all complying with specified requirements, and containing no other ingredients.

1. Colored Portland Cement-Lime Mix:
2. Formulate blend as required to produce color indicated or, if not indicated, as selected from manufacturer's standard colors.
3. Pigments do not exceed 10 percent of portland cement by weight.
4. Pigments do not exceed 5 percent of mortar cement by weight.

F. 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.

G. Aggregate for Grout: ASTM C404.

H. Water: Potable.

2.7 REINFORCEMENT

A. Uncoated-Steel Reinforcing Bars: ASTM A615/A615M or ASTM A996/A996M, Grade 60.

B. Masonry-Joint Reinforcement, General: ASTM A951/A951M.

1. Interior Walls: Hot-dip galvanized carbon steel.
2. Exterior Walls: Hot-dip galvanized carbon steel.
3. Wire Size for Side Rods: 0.148-inch diameter.
4. Wire Size for Cross Rods: 0.148-inch diameter.
5. Wire Size for Veneer Ties: 0.148-inch diameter for eye units and 0.187-inch for pintle units.

6. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than **16 inches** o.c.
7. Provide in lengths of not less than **10 ft.**, with prefabricated corner and tee units.

C. Masonry-Joint Reinforcement for Multiwythe Masonry:

1. Adjustable (two-piece) type, either ladder or truss design, with one side rod at each face shell of backing wythe and with separate adjustable ties with pintle-and-eye connections having a maximum horizontal play of **1/16 inch** and maximum vertical adjustment of **1-1/4 inches**. Size ties to extend at least halfway through facing wythe but with at least **5/8-inch** cover on outside face.

2.8 EMBEDDED FLASHING

A. Metal Flashing:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Cheney Flashing Company
b. Hohmann & Barnard, Inc
c. Keystone Flashing Company, Inc
d. Wire-Bond

2. General: Provide metal flashing complying with SMACNA's "Architectural Sheet Metal Manual" and as follows:

a. Stainless Steel: ASTM A240/A240M or ASTM A666, Type 304, **0.016 inch** thick.
b. Fabricate continuous flashings in sections **96 inches** long minimum, but not exceeding **12 ft.**. Provide splice plates at joints of formed, smooth metal flashing.
c. Fabricate metal drip edges from stainless steel. Extend at least **3 inches** into wall and **1/2 inch** out from wall, with outer edge bent down 30 degrees.
d. Solder metal items at corners.

B. Flexible Flashing: Use the following unless otherwise indicated:

1. Elastomeric Thermoplastic Flashing: Composite flashing product consisting of a polyester-reinforced ethylene interpolymer alloy.

a. Monolithic Sheet: Elastomeric thermoplastic flashing, **40 mil** thick.
b. Accessories: Provide preformed corners, end dams, other special shapes, and seaming materials produced by flashing manufacturer.

C. Solder and Sealants for Sheet Metal Flashings:

1. Solder for Stainless Steel: ASTM B32, Grade Sn96, with acid flux of type recommended by stainless steel sheet manufacturer.

D. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products

or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.

E. Termination Bars for Flexible Flashing: Stainless steel bars 1/8 inch by 1 inch.

2.9 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. Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D226/D226M, Type I (No. 15 asphalt felt).

C. Weep/Cavity Vents: Use the following unless otherwise indicated:

1. Cellular Plastic Weep/Vent: One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, full height and width of head joint and depth 1/8 inch less than depth of outer wythe, in color selected from manufacturer's standard.

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) 3GEN Masonry Products, Inc.
2) Advanced Building Products Inc.
3) Heckmann Building Products, Inc.
4) Hohmann & Barnard, Inc
5) Mortar Net Solutions
6) Wire-Bond

D. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.

1. Mortar Deflector: Strips, 1-1/2 inches thick and 10 inches high, with dovetail-shaped notches that prevent clogging with mortar droppings.

E. Proprietary Acidic Masonry Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

1. Manufacturers: Subject to compliance with requirements, provide products by the followingavailable manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Diedrich Technologies, Inc.; a Hohmann & Barnard company
b. EaCo Chem, Inc.

c. PROSOCO, Inc

2.10 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 or mortar cement mortar unless otherwise indicated.
3. For exterior masonry, use portland cement-lime or mortar cement mortar.
4. For reinforced masonry, use portland cement-lime or mortar cement mortar.
5. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.

B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.

C. Mortar for Unit Masonry: Comply with ASTM C270, Proportion Specification. Provide the following types of mortar for applications stated unless another type is indicated or needed to provide required compressive strength of masonry.

1. For masonry below grade or in contact with earth, use Type M.
2. For reinforced masonry, use Type M orType S in accordance with IBC Table 2103.7 (1).
3. For mortar parge coats, use Type S or Type N.
4. For exterior, above-grade, load-bearing, nonload-bearing walls, and parapet walls; for interior load-bearing walls; for interior nonload-bearing partitions; and for other applications where another type is not indicated, use Type N.

D. Pigmented Mortar: Use colored cement product or select and proportion pigments with other ingredients to produce color required. Do not add pigments to colored cement products.

1. Pigments do not exceed 10 percent of portland cement by weight.
2. Pigments do not exceed 5 percent of mortar cement by weight.
3. Mix to match Architect's sample.
4. Application: Use pigmented mortar for exposed mortar joints with the following units: clay face brick.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
2. Verify that foundations are within tolerances specified.
3. Verify that reinforcing dowels are properly placed.
4. Verify that substrates are free of substances that impair mortar bond.

B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Thickness: Build cavity and composite walls and other masonry construction to full thickness shown. Build single-wythe walls to actual widths of masonry units, using units of widths indicated.

B. Build chases and recesses to accommodate items specified in this and other Sections.

C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match construction immediately adjacent to opening.

D. 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.

E. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures. Mix units from several pallets or cubes as they are placed.

F. Matching Existing Masonry: Match coursing, bonding, color, and texture of existing masonry.

G. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds **30 g/30 sq. in.** per minute when tested in accordance with ASTM C67/C67M. Allow units to absorb water so they are damp but not wet at time of laying.

3.3 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** or minus **1/4 inch**.
2. For location of elements in plan, do not vary from that indicated by more than plus or minus **1/2 inch**.
3. For location of elements in elevation, do not vary from that indicated by more than plus or minus **1/4 inch** in a story height or **1/2 inch** total.

B. Lines and Levels:

1. For bed joints and top surfaces of bearing walls, do not vary from level by more than **1/4 inch in 10 ft.**, or **1/2-inch** maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than **1/8 inch in 10 ft.**, **1/4 inch in 20 ft.**, or **1/2-inch** maximum.
3. For vertical lines and surfaces, do not vary from plumb by more than **1/4 inch in 10 ft.**, **3/8 inch in 20 ft.**, or **1/2-inch** 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 in 10 ft.**, **1/4 inch in 20 ft.**, or **1/2-inch** maximum.
5. For lines and surfaces, do not vary from straight by more than **1/4 inch in 10 ft.**, **3/8 inch in 20 ft.**, or **1/2-inch** maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than **1/4 inch in 10 ft.**, or **1/2-inch** maximum.
7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than **1/16 inch** except due to warpage of masonry units within tolerances specified for warpage of units.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus **1/8 inch**, with a maximum thickness limited to **1/2 inch**.
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than **1/8 inch**.
3. For head and collar joints, do not vary from thickness indicated by more than plus **3/8 inch** or minus **1/4 inch**.
4. For exposed head joints, do not vary from thickness indicated by more than plus or minus **1/8 inch**.
5. For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than **1/16 inch** from one masonry unit to the next.

3.4 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. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less-than-nominal **4-inch** horizontal face dimensions at corners or jambs.

C. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 4 inches. Bond and interlock each course of each wythe at corners. Do not use units with less-than-nominal **4-inch** horizontal face dimensions at corners or jambs.

D. Stopping and Resuming Work: Stop work by stepping back units in each course from those in

course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.

E. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.

F. 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.

G. Fill cores in hollow CMUs with grout **24 inches** under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.

3.5 MORTAR BEDDING AND JOINTING

A. Lay 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.
5. Fully bed units and fill cells with mortar at anchors and ties as needed to fully embed anchors and ties in mortar.

B. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.

C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness to match joints of brick veneer of existing building.

D. Cut joints flush where indicated to receive waterproofing unless otherwise indicated.

3.6 CAVITY WALLS

A. Bond wythes of cavity walls together as follows:

1. Masonry-Joint Reinforcement: Installed in horizontal mortar joints.

    a. Where one wythe is of clay masonry and the other of concrete masonry, use adjustable-type (two-piece-type) reinforcement to allow for differential movement regardless of whether bed joints align.

2. Header Bonding: Provide masonry unit headers extending not less than **3 inches** into each wythe. Space headers not more than 8 inches clear horizontally and **16 inches** clear vertically.

3. Masonry-Veneer Anchors: Comply with requirements for anchoring masonry veneers.

B. Bond wythes of cavity walls together using bonding system indicated on Drawings.

C. Keep cavities clean of mortar droppings and other materials during construction. Bevel beds away from cavity, to minimize mortar protrusions into cavity. Do not attempt to trowel or remove mortar fins protruding into cavity.

D. Installing Cavity Wall Insulation: Place small dabs of adhesive, spaced approximately **12 inches** o.c. both ways, on inside face of insulation boards, or attach with plastic fasteners designed for this purpose. Fit courses of insulation between wall ties and other confining obstructions in cavity, with edges butted tightly both ways. Press units firmly against inside wythe of masonry or other construction as indicated.

1. Fill cracks and open gaps in insulation with crack sealer compatible with insulation and masonry.

3.7 ANCHORED MASONRY VENEERS

A. Anchor masonry veneers to concrete and masonry backup with masonry-veneer anchors to comply with the following requirements:

1. Embed tie sections in masonry joints.
2. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
3. Space anchors as indicated, but not more than **18 inches** o.c. vertically and horizontally. Install additional anchors within **12 inches** of openings and at intervals, not exceeding **24 inches**, around perimeter.

B. Provide not less than 1 3/4 inch of airspace between back of masonry veneer and face of insulation.

1. Keep airspace clean of mortar droppings and other materials during construction. Bevel beds away from airspace, to minimize mortar protrusions into airspace. Do not attempt to trowel or remove mortar fins protruding into airspace.

3.8 MASONRY-JOINT REINFORCEMENT

A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of **5/8 inch** on exterior side of walls, **1/2 inch** elsewhere. Lap reinforcement a minimum of **6 inches**.

B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.

C. Provide continuity at corners by using prefabricated L-shaped units.

3.9 CONTROL AND EXPANSION JOINTS

A. General: Install control- and expansion-joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.

B. Form control joints in concrete masonry as follows:

1. Install interlocking units designed for control joints. Install bond-breaker strips at joint. Keep head joints free and clear of mortar, or rake out joint for application of sealant.

C. Provide horizontal, pressure-relieving joints by either leaving an airspace or inserting a compressible filler of width required for installing sealant and backer rod specified in Section 079200 "Joint Sealants," but not less than 3/8 inch.

3.10 LINTELS

A. Install steel lintels where indicated.

B. Provide masonry lintels where indicated and where openings of more than **12 inches** for brick-size units and **24 inches** for block-size units are indicated without structural steel or other supporting lintels.

C. Provide minimum bearing of **8 inches** at each jamb unless otherwise indicated.

3.11 FLASHING, WEEP HOLES, AND CAVITY VENTS

A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated. Install cavity vents at shelf angles, ledges, and other obstructions to upward flow of air in cavities, and where indicated.

B. Install flashing as follows unless otherwise indicated:

1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
2. At multiwythe masonry walls, including cavity walls, extend flashing through outer wythe, turned up a minimum of 8 inches, and through inner wythe to within **1/2 inch** of the interior face of wall in exposed masonry. Where interior face of wall is to receive furring or framing, carry flashing completely through inner wythe and turn flashing up approximately **2 inches** on interior face.
3. At lintels and shelf angles, extend flashing **6 inches** minimum, to edge of next full unit at each end. At heads and sills, extend flashing **6 inches** minimum, to edge of next full unit and turn ends up not less than **2 inches** to form end dams.

4. Install metal drip edges beneath flexible flashing at exterior face of wall. Stop flexible flashing **1/2 inch** back from outside face of wall, and adhere flexible flashing to top of metal drip edge.

C. Install reglets and nailers for flashing and other related construction where they are indicated to be built into masonry.

D. Install weep holes in exterior wythes and veneers in head joints of first course of masonry immediately above embedded flashing.

1. Use specified weep/cavity vent products to form weep holes.
2. Space weep holes **24 inches** o.c. unless otherwise indicated.

E. Place cavity drainage material in airspace behind veneers to comply with configuration requirements for cavity drainage material in "Accessories" Article.

F. Install cavity vents in head joints in exterior wythes at spacing indicated. Use specified weep/cavity vent products to form cavity vents.

3.12 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 that of other loads that may be placed on them during construction.

B. Placing Reinforcement: Comply with requirements in TMS 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 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
2. Limit height of vertical grout pours to not more than 60 inches.

3.13 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections. 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 will be at Contractor's expense.

B. Inspections: Special inspections in accordance with Level 2 in TMS 402.

1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
2. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.
3. Place grout only after inspectors have verified proportions of site-prepared grout.

C. Testing Prior to Construction: One set of tests.

D. Testing Frequency: One set of tests for each **5000 sq. ft.** of wall area or portion thereof.

E. Clay Masonry Unit Test: For each type of unit provided, in accordance with ASTM C67/C67M for compressive strength.

F. Concrete Masonry Unit Test: For each type of unit provided, in accordance with ASTM C140/C140M for compressive strength.

G. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, in accordance with ASTM C780.

H. Mortar Test (Property Specification): For each mix provided, in accordance with ASTM C780. Test mortar for mortar air content and compressive strength.

I. Grout Test (Compressive Strength): For each mix provided, in accordance with ASTM C1019.

3.14 PARGING

A. Parge exterior faces of below-grade masonry walls, where indicated, in two uniform coats to a total thickness of **3/4 inch**. 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 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.

3.15 REPAIRING, POINTING, AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.

C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

D. 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.
3. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
4. Clean masonry with a proprietary acidic masonry cleaner applied according to manufacturer's written instructions.

3.16 MASONRY WASTE DISPOSAL

A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.

B. Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.

1. Crush masonry waste to less than **4 inches** in each dimension.
2. Mix masonry waste with at least two parts of specified fill material for each part of masonry waste. Fill material is specified in Section 312000 "Earth Moving."

C. Masonry Waste Recycling: Return broken CMUs not used as fill to manufacturer for recycling.

D. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above or recycled, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 042000

SECTION 055213 - PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Aluminum railings.

1.2 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.3 ACTION SUBMITTALS

A. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

B. Delegated Design Submittal: For railings, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel in accordance with the following:

1. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protect mechanical finishes on exposed surfaces of railings from damage by applying a strippable, temporary protective covering before shipping.

1.6 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with

railings by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design railings, including attachment to building construction.

B. Structural Performance: Railings, including attachment to building construction, withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails and Top Rails of Guards:

a. Uniform load of 50 lbf/ ft. applied in any direction.
b. Concentrated load of 200 lbf applied in any direction.
c. Uniform and concentrated loads need not be assumed to act concurrently.

2. Infill of Guards:

a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft..
b. Infill load and other loads need not be assumed to act concurrently.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

B. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.

1. Provide type of bracket with flange tapped for concealed anchorage to threaded hanger bolt and that provides 1-1/2-inch clearance from inside face of handrail to finished wall surface.

2.3 ALUMINUM RAILINGS

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. ATR Technologies, Inc.
2. CraneVeyor Corp
3. Hollaender Mfg. Co.
4. Julius Blum & Co., Inc.
5. Kane Innovations, Inc.
6. Kattsafe
7. Kee Safety, Inc.
8. Moultrie Rail Systems
9. Superior Aluminum Products, Inc
10. Thompson Fabricating, LLC
11. TimberTech, AZEK Building Products; The AZEK Company LLC
12. Trex Commercial Products, Inc.
13. Tri Tech, Inc.
14. Tubular Specialties Manufacturing, Inc.
15. Tuttle, a Dant Clayton Division
16. Wagner Companies (The); R&B Wagner, Inc.

B. Source Limitations: Obtain each type of railing from single source from single manufacturer.

C. Aluminum, General: Provide alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than the strength and durability properties of alloy and temper designated below for each aluminum form required.

D. Extruded Bars and Tubing: ASTM B221, Alloy 6063-T5/T52.

E. Extruded Structural Pipe and Round Tubing: ASTM B429/B429M, Alloy 6063-T6.

1. Provide Standard Weight (Schedule 40) pipe unless otherwise indicated.

F. Drawn Seamless Tubing: ASTM B210/B210M, Alloy 6063-T832.

2.4 FASTENERS

A. Fastener Materials:

1. Aluminum Railing Components: Type 316 stainless steel fasteners.
2. Finish exposed fasteners to match appearance, including color and texture, of railings.

B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction and capable of withstanding design loads.

C. Fasteners for Interconnecting Railing Components:

1. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless exposed fasteners are unavoidable or are the standard fastening method for railings indicated.

D. Post-Installed 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 AC193 .

1. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 2 stainless steel bolts, ASTM F593, and nuts, ASTM F594.

2.5 MISCELLANEOUS MATERIALS

A. Handrail Brackets: Cast aluminum, center of handrail 3-1/8 inches from wall.

B. Welding Rods and Bare Electrodes: Select in accordance with AWS specifications for metal alloy welded.

1. For aluminum railings, provide type and alloy as recommended by producer of metal to be welded and as required for color match, strength, and compatibility in fabricated items.

C. Etching Cleaner for Galvanized Metal: Complying with MPI#25.

D. Galvanizing Repair Paint: High-zinc-dust-content paint, complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

E. Shop Primers: Provide primers that comply with Section 099113 "Exterior Painting."

F. Intermediate Coats and Topcoats: Provide products that comply with Section 099113 "Exterior Painting."

G. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound.

1. Water-Resistant Product: At exterior locations, provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended by manufacturer for exterior use.

2.6 FABRICATION

A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage , but not less than that required to support structural loads.

B. Shop assemble railings to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations.

1. Clearly mark units for reassembly and coordinated installation.
2. Use connections that maintain structural value of joined pieces.

C. Cut, drill, and punch metals cleanly and accurately.

1. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated.
2. Remove sharp or rough areas on exposed surfaces.

D. Form work true to line and level with accurate angles and surfaces.

E. Fabricate connections that are exposed to weather in a manner that excludes water.

1. Provide weep holes where water may accumulate.
2. Locate weep holes in inconspicuous locations.

F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

G. Connections: Fabricate railings with welded connections unless otherwise indicated.

H. Welded Connections for Aluminum Pipe: Fabricate railings to interconnect members with concealed internal welds that eliminate surface grinding, using manufacturer's standard system of sleeve and socket fittings.

I. Nonwelded Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.

1. Fabricate splice joints for field connection, using an epoxy structural adhesive, if this is manufacturer's standard splicing method.

J. Form changes in direction as follows:

1. By bending or by inserting prefabricated elbow fittings.

K. Bend members in jigs to produce uniform curvature for each configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

L. Close exposed ends of hollow railing members with prefabricated cap and end fittings of same metal and finish as railings.

M. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.

N. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.

O. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work.

1. Fabricate anchorage devices capable of withstanding loads imposed by railings.
2. Coordinate anchorage devices with supporting structure.

P. For railing posts set in concrete, provide stainless steel sleeves not less than **6 inches** long with inside dimensions not less than **1/2 inch** greater than outside dimensions of post, with metal plate forming bottom closure.

2.7 ALUMINUM FINISHES

A. Color Anodic Finish: AAMA 611, AA-M12C22A42/A44.

1. Color: As selected by Architect from full range of industry colors and color densities.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Perform cutting, drilling, and fitting required for installing railings.

1. Fit exposed connections together to form tight, hairline joints.
2. Install railings level, plumb, square, true to line; without distortion, warp, or rack.
3. Set railings accurately in location, alignment, and elevation; measured from established lines and levels.
4. Do not weld, cut, or abrade surfaces of railing components that are coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
5. Set posts plumb within a tolerance of **1/16 inch in 3 feet**.
6. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed **1/4 inch in 12 feet**.

B. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1. Coat concealed surfaces of aluminum that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

C. Adjust railings before anchoring to ensure matching alignment at abutting joints.

D. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.2 RAILING CONNECTIONS

A. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting railing components. Use wood blocks and padding to prevent damage to railing members and fittings. Seal recessed holes of exposed locking screws, using plastic cement filler colored to match finish of railings.

B. Expansion Joints: Install expansion joints at locations indicated but not farther apart than

required to accommodate thermal movement. Provide slip-joint internal sleeve, extending 2 inches beyond joint on either side; fasten internal sleeve securely to one side; and locate joint within 6 inches of post.

3.3 ANCHORING POSTS

A. Form or core-drill holes not less than 5 inches deep and 3/4 inch larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.

B. Leave anchorage joint exposed with 1/8-inch buildup, sloped away from post.

3.4 ATTACHING RAILINGS

A. Anchor railing ends to concrete and masonry with flanges connected to railing ends and anchored to wall construction with anchors and bolts.

B. Attach handrails to walls with wall brackets , except where end flanges are used. Provide brackets with 1-1/2-inch clearance from inside face of handrail and finished wall surface.

1. Use type of bracket with flange tapped for concealed anchorage to threaded hanger bolt.
2. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.

C. Secure wall brackets and railing end flanges to building construction as follows:

1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
2. For hollow masonry anchorage, use toggle bolts.
3. For wood stud partitions, use hanger or lag bolts set into studs or wood backing between studs. Coordinate with carpentry work to locate backing members.

3.5 REPAIR

A. Touchup Painting:

1. Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

a. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.

3.6 CLEANING

A. Clean aluminum by washing thoroughly with clean water and soap and rinsing with clean water.

3.7 PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

B. Restore finishes damaged during installation and construction period, so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION 055213

SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Framing with dimension lumber.
2. Framing with engineered wood products.
3. Wood blocking and nailers.

B. Related Requirements:
1. Section 061600 "Sheathing."
2. Section 313116 "Termite Control" for site application of borate treatment to wood framing.

1.2 DEFINITIONS

A. Exposed Framing: Framing not concealed by other construction.

B. Dimension Lumber: Lumber of 2 inches nominal or greater but less than 5 inches nominal in least dimension.

C. Timber: Lumber of 5 inches nominal or greater in least dimension.

D. Lumber grading agencies, and the abbreviations used to reference them, include the following:

1. NeLMA: Northeastern Lumber Manufacturers' Association.
2. NLGA: National Lumber Grades Authority.
3. RIS: Redwood Inspection Service.
4. SPIB: The Southern Pine Inspection Bureau.
5. WCLIB: West Coast Lumber Inspection Bureau.
6. WWPA: Western Wood Products Association.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials

comply with requirements. Indicate type of preservative used and net amount of preservative retained.

2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
3. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5664.
4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
5. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

B. Fastener Patterns: Full-size templates for fasteners in exposed framing.

1.4 INFORMATIONAL SUBMITTALS

A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

B. Evaluation Reports: For the following, from ICC-ES:

1. Wood-preservative-treated wood.
2. Fire-retardant-treated wood.
3. Engineered wood products.
4. Shear panels.
5. Power-driven fasteners.
6. Powder-actuated fasteners.
7. Expansion anchors.
8. Metal framing anchors.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

1. Dimension lumber framing.
2. Timber.
3. Laminated-veneer lumber.
4. Parallel-strand lumber.
5. Prefabricated wood I-joists.
6. Rim boards.
7. Miscellaneous lumber.

B. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece or omit grade stamp and provide certificates of grade compliance issued by grading agency.
3. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
4. Provide dressed lumber, S4S, unless otherwise indicated.

C. Maximum Moisture Content of Lumber: 15 percent for 2-inch nominal thickness or less, 19 percent for more than 2-inch nominal thickness unless otherwise indicated.

D. Engineered Wood Products: Provide engineered wood products acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.

1. Allowable Design Stresses: Provide engineered wood products with allowable design stresses, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and

demonstrated by comprehensive testing performed by a qualified independent testing agency.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
2. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece or omit marking and provide certificates of treatment compliance issued by inspection agency.

D. Application: Treat items indicated on Drawings, and the following:

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
4. Wood framing members that are less than 18 inches above the ground in crawlspaces or unexcavated areas.
5. Wood floor plates that are installed over concrete slabs-on-grade.

2.3 DIMENSION LUMBER FRAMING

A. Non-Load-Bearing Interior Partitions: Construction or No. 2 grade.

1. Application: All interior partitions.
2. Species:
   a. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

B. Joists, Rafters, and Other Framing Not Listed Above: No. 2 grade.

1. Species:
   a. Mixed southern pine; SPIB.

C. Joists, Rafters, and Other Framing Not Listed Above: Any species of machine stress-rated dimension lumber with a grade of not less than 1650f-1.5E.

D. Exposed Framing: Provide material hand-selected for uniformity of appearance and freedom from characteristics, on exposed surfaces and edges, that would impair finish appearance, including decay, honeycomb, knot-holes, shake, splits, torn grain, and wane.

1. Application: Exposed exterior and interior framing indicated to receive a stained or natural finish.
2. Species and Grade: Southern pine; No. 2 grade; SPIB.
3. Species and Grade: Mixed southern pine; No. 2 grade; SPIB.
4. Species and Grade: Spruce-pine-fir (south); No. 1 grade; NeLMA, WCLIB, or WWPA.
5. Species and Grade: Western cedars; No. 1 grade; WCLIB or WWPA.

2.4 ENGINEERED WOOD PRODUCTS

A. Engineered Wood Products, General: Products shall contain no urea formaldehyde.

B. Source Limitations: Obtain each type of engineered wood product from single source from a single manufacturer.

C. Laminated-Veneer Lumber: Structural composite lumber made from wood veneers with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D 5456 and manufactured with an exterior-type adhesive complying with ASTM D 2559.

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. Boise Cascade Corporation.
   b. Finnforest USA.
   c. Georgia-Pacific.
   d. Jager Building Systems Inc.
   e. Louisiana-Pacific Corporation.
   f. Pacific Woodtech Corporation.
   g. Roseburg Forest Products Co.
   h. Standard Structures Inc.
   i. Stark Truss Company, Inc.
   j. West Fraser Timber Co., Ltd.
   k. Weyerhaeuser Company.
   l. .

2. Extreme Fiber Stress in Bending, Edgewise: 2900 psi for 12-inch nominal-depth members.
3. Modulus of Elasticity, Edgewise: 2,000,000 psi.

D. Parallel-Strand Lumber: Structural composite lumber made from wood strand elements with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D 5456 and manufactured with an exterior-type adhesive complying with ASTM D 2559.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

   a. Louisiana-Pacific Corporation.
   b. Weyerhaeuser Company..

2. Extreme Fiber Stress in Bending, Edgewise: 2900 psi for 12-inch nominal-depth members.
3. Modulus of Elasticity, Edgewise: 2,200,000 psi.

2.5 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Nailers.
3. Rooftop equipment bases and support curbs.
4. Cants.
5. Furring.
6. Grounds.
7. Utility shelving.

B. For items of dimension lumber size, provide Construction or No. 2 grade lumber
1. Mixed southern pine; SPIB.

C. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.

D. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

E. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

2.6 PLYWOOD BACKING PANELS

A. Equipment Backing Panels: DOC PS 1, Exterior, AC, in thickness indicated or, if not indicated, not less than 1/2-inch nominal thickness.

1. Plywood shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.7 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners of Type 304 stainless steel.

B. Nails, Brads, and Staples: ASTM F 1667.

NES NER-272 covers power-driven staples, nails, P-nails, and allied fasteners.Power-Driven Fasteners: NES NER-272.

D. Wood Screws: ASME B18.6.1.

E. Lag Bolts: ASME B18.2.1.

F. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.

G. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry assemblies and equal to four times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.

1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
2. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2.

2.8 METAL FRAMING ANCHORS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. Cleveland Steel Specialty Co.
2. KC Metals Products, Inc.
3. Phoenix Metal Products, Inc.
4. Simpson Strong-Tie Co., Inc.
5. USP Structural Connectors.

C. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those of products of manufacturers listed. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

D. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 coating designation.

1. Use for interior locations unless otherwise indicated.

E. Hot-Dip, Heavy-Galvanized Steel Sheet: ASTM A 653/A 653M; structural steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 coating designation; and not less than 0.036 inch thick.

1. Use for wood-preservative-treated lumber and where indicated.

F. Stainless-Steel Sheet: ASTM A 666, Type 304.

1. Use for exterior locations and where indicated.

G. Joist Hangers: U-shaped joist hangers with 2-inch- long seat and 1-1/4-inch- wide nailing flanges at least 85 percent of joist depth.

1. Thickness: 0.050 inch.

H. Top Flange Hangers: U-shaped joist hangers, full depth of joist, formed from metal strap with tabs bent to extend over and be fastened to supporting member.

1. Strap Width: 1-1/2 inches.
2. Thickness: 0.050 inch.

I. Bridging: Rigid, V-section, nailless type, 0.050 inch thick, length to suit joist size and spacing.

J. Post Bases: Adjustable-socket type for bolting in place with standoff plate to raise post 1 inch above base and with 2-inch- minimum side cover, socket 0.062 inch thick, and standoff and adjustment plates 0.108 inch thick.

K. Joist Ties: Flat straps, with holes for fasteners, for tying joists together over supports.

1. Width: 3/4 inch.
2. Thickness: 0.050 inch.
3. Length: 16 inches.

L. Rafter Tie-Downs: Bent strap tie for fastening rafters or roof trusses to wall studs below, 1-1/2 inches wide by 0.050 inch thick. Tie fastens to side of rafter or truss, face of top plates, and side of stud below.

M. Rafter Tie-Downs (Hurricane or Seismic Ties): Bent strap tie for fastening rafters or roof trusses to wall studs below, 2-1/4 inches wide by 0.062 inch thick. Tie fits over top of rafter or truss and fastens to both sides of rafter or truss, face of top plates, and side of stud below.

N. Hold-Downs: Brackets for bolting to wall studs and securing to foundation walls with anchor bolts or to other hold-downs with threaded rods and designed with first of two bolts placed seven bolt diameters from reinforced base.

1. Bolt Diameter: 5/8 inch.
2. Width: 2-1/2 inches.
3. Body Thickness: 0.108 inch.
4. Base Reinforcement Thickness: 0.108 inch.

O. Wall Bracing: T-shaped bracing made for letting into studs in saw kerf, 1-1/8 inches wide by 9/16 inch deep by 0.034 inch thick with hemmed edges.

P. Wall Bracing: Angle bracing made for letting into studs in saw kerf, 15/16 by 15/16 by 0.040 inch thick with hemmed edges.

2.9 MISCELLANEOUS MATERIALS

A. Sill-Sealer Gaskets: Glass-fiber-resilient insulation, fabricated in strip form, for use as a sill sealer; 1-inch nominal thickness, compressible to 1/32 inch; selected from manufacturer's standard widths to suit width of sill members indicated.

B. Sill-Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to suit width of sill members indicated.

C. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber or rubberized-asphalt compound, bonded to a high-density

polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch.

D. Adhesives for Gluing Furring and Sleepers to Concrete or Masonry: Formulation complying with ASTM D 3498 that is approved for use indicated by adhesive manufacturer.

1. Adhesives shall have a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
2. Adhesives shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

E. Water-Repellent Preservative: NWWDA-tested and -accepted formulation containing 3-iodo-2-propynyl butyl carbamate, combined with an insecticide containing chloropyrifos as its active ingredient.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.

B. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

C. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.

D. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels.

E. Shear Wall Panels: Install shear wall panels to comply with manufacturer's written instructions.

F. Metal Framing Anchors: Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.

G. Install sill sealer gasket to form continuous seal between sill plates and foundation walls.

H. Do not splice structural members between supports unless otherwise indicated.

I. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches o.c.

J. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:

1. Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 inches o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.
2. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal- thickness.
3. Fire block concealed spaces between floor sleepers with same material as sleepers to limit concealed spaces to not more than 100 sq. ft. and to solidly fill space below partitions.
4. Fire block concealed spaces behind combustible cornices and exterior trim at not more than 20 feet o.c.

K. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

L. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

1. Use inorganic boron for items that are continuously protected from liquid water.
2. Use copper naphthenate for items not continuously protected from liquid water.

M. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. NES NER-272 for power-driven fasteners.
2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
3. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.

N. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install

fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

O. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.

1. Comply with approved indicated fastener patterns where applicable.
2. Use finishing nails unless otherwise indicated. Countersink nail heads and fill holes with wood filler.
3. Use common nails unless otherwise indicated. Drive nails snug but do not countersink nail heads.

3.2 WOOD BLOCKING, AND NAILER INSTALLATION

A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

C. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

D. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

3.3 WALL AND PARTITION FRAMING INSTALLATION

A. General: Provide single bottom plate and double top plates using members of 2-inch nominal thickness whose widths equal that of studs, except single top plate may be used for non-load-bearing partitions. Fasten plates to supporting construction unless otherwise indicated.

1. For exterior walls, provide 2-by-6-inch nominal- size wood studs spaced 16 inches o.c. unless otherwise indicated.
2. For interior partitions and walls, provide 2-by-4-inch nominal- size wood studs spaced 16 inches o.c. unless otherwise indicated.
3. Provide continuous horizontal blocking at midheight of partitions more than 96 inches high, using members of 2-inch nominal thickness and of same width as wall or partitions.

B. Construct corners and intersections with three or more studs, except that two studs may be used for interior non-load-bearing partitions.

C. Frame openings with multiple studs and headers. Provide nailed header members of thickness equal to width of studs. Support headers on jamb studs.

1. For non-load-bearing partitions, provide double-jamb studs and headers not less than 4-inch nominal depth for openings 48 inches and less in width, 6-inch nominal depth for openings 48 to 72 inches in width, 8-inch nominal depth for openings 72 to 120 inches in width, and not less than 10-inch nominal depth for openings 10 to 12 feet in width.
2. For load-bearing walls, provide double-jamb studs for openings 60 inches and less in width, and triple-jamb studs for wider openings. Provide headers of depth indicated or, if not indicated, according to Table R502.5(1) or Table R502.5(2), as applicable, in ICC's International Residential Code for One- and Two-Family Dwellings.
3. .

3.4 CEILING JOIST AND RAFTER FRAMING INSTALLATION

A. Ceiling Joists: Install ceiling joists with crown edge up and complying with requirements specified above for floor joists. Face nail to ends of parallel rafters.

1. Where ceiling joists are at right angles to rafters, provide additional short joists parallel to rafters from wall plate to first joist; nail to ends of rafters and to top plate and nail to first joist or anchor with framing anchors or metal straps. Provide 1-by-8-inch nominal- size or 2-by-4-inch nominal- size stringers spaced 48 inches o.c. crosswise over main ceiling joists.

B. Rafters: Notch to fit exterior wall plates and use metal framing anchors. Double rafters to form headers and trimmers at openings in roof framing, if any, and support with metal hangers. Where rafters abut at ridge, place directly opposite each other and nail to ridge member or use metal ridge hangers.

1. At valleys, provide double-valley rafters of size indicated or, if not indicated, of same thickness as regular rafters and 2 inches deeper. Bevel ends of jack rafters for full bearing against valley rafters.
2. At hips, provide hip rafter of size indicated or, if not indicated, of same thickness as regular rafters and 2 inches deeper. Bevel ends of jack rafters for full bearing against hip rafter.

C. Provide collar beams (ties) as indicated or, if not indicated, provide 1-by-6-inch nominal- size boards between every third pair of rafters, but not more than 48 inches o.c. Locate below ridge member, at third point of rafter span. Cut ends to fit roof slope and nail to rafters.

D. Provide special framing as indicated for eaves, overhangs, dormers, and similar conditions if any.

3.5 PROTECTION

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes sufficiently wet that moisture content exceeds that specified, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 06100

SECTION 061600 - SHEATHING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Roof sheathing.

B. Related Requirements:

1. Section 061000 "Rough Carpentry" for plywood backing panels.
2. Section 072500 "Weather Barriers" for water-resistive barrier applied over wall sheathing.

1.2 DELIVERY, STORAGE, AND HANDLING

A. Stack panels flat with spacers beneath and between each bundle to provide air circulation. Protect sheathing from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PANEL PRODUCTS

1. Plywood.
2. Oriented strand board.
3. Particleboard underlayment.
4. Hardboard underlayment.
5. Plywood.
6. Oriented strand board.
7. Particleboard underlayment.
8. Hardboard underlayment.
9. Plywood.
10. Oriented strand board.
11. Particleboard underlayment.
12. Hardboard underlayment.
13. Plywood.
14. Oriented strand board.
15. Particleboard underlayment.
16. Hardboard underlayment.
17. Plywood.
18. Oriented strand board.

19. Particleboard underlayment.
20. Hardboard underlayment.

B. Thickness: As needed to comply with requirements specified, but not less than thickness indicated.

C. Factory mark panels to indicate compliance with applicable standard.

D. Plywood Sheathing, Walls: [**DOC PS 1**][**Either DOC PS 1 or DOC PS 2**], [**Exterior, Structural I**][**Exterior**][**Exposure 1, Structural I**][**Exposure 1**] sheathing.

1. Span Rating: Not less than [**16/0**][**20/0**][**24/0**][**32/16**].
2. Nominal Thickness: Not less than [**11/32 inch**][**3/8 inch**][**1/2 inch**].

E. Oriented-Strand-Board Sheathing, Walls: DOC PS 2, [**Exposure 1, Structural I**][**Exposure 1**] sheathing.

1. Span Rating: Not less than [**16/0**][**20/0**][**24/0**][**24/16**][**32/16**].
2. Nominal Thickness: Not less than [**5/16 inch**][**3/8 inch**][**1/2 inch**].

F. Fiberboard Sheathing: ASTM C208, Type IV, [**Grade 1 (Regular)**][**Grade 2 (Structural)**] cellulosic fiberboard sheathing with square edges, [**1/2 inch**][**25/32 inch**] thick.

2.2 ROOF SHEATHING

A. Plywood Sheathing, Roofs: DOC PS 1, Exposure 1 sheathing.

1. Span Rating: Not less than 40/20.
2. Nominal Thickness: Not less than 5/8 inch.

2.3 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. For roof sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A153/A153M.
2. For roof sheathing, provide fasteners with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours in accordance with ASTM B117.

B. Nails, Brads, and Staples: ASTM F1667.

C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

D. Screws for Fastening Sheathing to Wood Framing: ASTM C1002.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.

B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.

C. Securely attach to substrate by fastening as indicated, complying with the following:

1. Table 2304.10.1, "Fastening Schedule," in the ICC's International Building Code.
2. ICC-ES evaluation report for fastener.

D. Use common wire nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections. Install fasteners without splitting wood.

E. Coordinate roof sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.

F. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

3.2 INSTALLATION OF WOOD STRUCTURAL PANEL

A. General: Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.

B. Fastening Methods: Fasten panels as indicated below:

1. Wall and Roof Sheathing:

a. Nail to wood framing.
b. Space panels **1/8 inch** apart at edges and ends.
c. Fasten with 8d rink shank nails with full, round head. No clipped head nails allowed.
d. Spacing: Fasten at 4 inch o.c. along all structural members (field and perimeter).

C. Provide "H" clip ("plyclip") between abutting sheets of plywood, with one clip at each truss bay.

3.3 FIELD QUALITY CONTROL

A. Testing and Inspecting Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Tests: As indicated on the Drawings.

END OF SECTION 061600

SECTION 061753 - SHOP-FABRICATED WOOD TRUSSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Wood roof trusses.
   2. Wood truss bracing.

B. Related Requirements:
   1. Section 061600 "Sheathing" for roof sheathing and subflooring.

1.3 DEFINITIONS

A. Metal-Plate-Connected Wood Trusses: Planar structural units consisting of metal-plate-connected members fabricated from dimension lumber and cut and assembled before delivery to Project site.

1.4 ACTION SUBMITTALS

A. Product Data: For wood-preservative-treated lumber, fire-retardant-treated lumber, metal-plate connectors, metal truss accessories, and fasteners.
   1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
   2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to truss fabricator.
   3. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

B. Shop Drawings: Show fabrication and installation details for trusses.
   1. Show location, pitch, span, camber, configuration, and spacing for each type of truss required.
   2. Indicate sizes, stress grades, and species of lumber.

3. Indicate locations of permanent bracing required to prevent buckling of individual truss members due to design loads and transfer of lateral loads due to wind and seismic loads.
4. Indicate locations, sizes, and materials for permanent bracing required to prevent buckling of individual truss members and overall roof system due to design loads.
5. Indicate type, size, material, finish, design values, orientation, and location of metal connector plates.
6. Show splice details and bearing details.

C. Delegated-Design Submittal: For metal-plate-connected wood trusses indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For metal connector-plate manufacturer professional engineer and fabricator.

B. Material Certificates: For dimension lumber specified to comply with minimum specific gravity. Indicate species and grade selected for each use and specific gravity.

C. Product Certificates: For metal-plate-connected wood trusses, signed by officer of truss fabricating firm.

D. Evaluation Reports: For the following, from ICC-ES:
1. Wood-preservative-treated lumber.
2. Metal-plate connectors.
3. Metal truss accessories.

1.6 QUALITY ASSURANCE

A. Metal Connector-Plate Manufacturer Qualifications: A manufacturer that is a member of TPI and that complies with quality-control procedures in TPI 1 for manufacture of connector plates.
1. Manufacturer's responsibilities include providing professional engineering services needed to assume engineering responsibility.
2. Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.

B. Fabricator Qualifications: Shop that participates in a recognized quality-assurance program that complies with quality-control procedures in TPI 1 and that involves third-party inspection by an independent testing and inspecting agency acceptable to Architect and authorities having jurisdiction.

C. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Handle and store trusses to comply with recommendations in TPI BCSI**,** "Building Component Safety Information: Guide to Good Practice for Handling, Installing, Restraining, & Bracing Metal Plate Connected Wood Trusses."
   1. Store trusses flat, off of ground, and adequately supported to prevent lateral bending.
   2. Protect trusses from weather by covering with waterproof sheeting, securely anchored.
   3. Provide for air circulation around stacks and under coverings.

B. Inspect trusses showing discoloration, corrosion, or other evidence of deterioration. Discard and replace trusses that are damaged or defective.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design metal-plate-connected wood trusses.

B. Structural Performance: Provide metal-plate-connected wood trusses capable of withstanding design loads within limits and under conditions indicated. Comply with requirements in TPI 1 unless more stringent requirements are specified below.
   1. Design Loads: As indicated.
   2. Maximum Deflection Under Design Loads:
      a. Roof Trusses: Vertical deflection of 1/240 of span.

C. Comply with applicable requirements and recommendations of the following publications:
   1. TPI 1, "National Design Standard for Metal Plate Connected Wood Truss Construction."
   2. TPI DSB, "Recommended Design Specification for Temporary Bracing of Metal Plate Connected Wood Trusses."
   3. TPI BCSI, "Building Component Safety Information: Guide to Good Practice for Handling, Installing, Restraining, & Bracing Metal Plate Connected Wood Trusses."

D. Wood Structural Design Standard: Comply with applicable requirements in AF&PA's "National Design Specifications for Wood Construction" and its "Supplement."

2.2 DIMENSION LUMBER

A. Certified Wood: For metal-plate-connected wood trusses and permanent bracing, provide materials produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."

B. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
1. Factory mark each piece of lumber with grade stamp of grading agency.
2. For exposed lumber indicated to receive a stained or natural finish, omit grade stamp and provide certificates of grade compliance issued by grading agency.
3. Provide dressed lumber, S4S.
4. Provide dry lumber with 19 percent maximum moisture content at time of dressing.

C. Minimum Chord Size for Roof Trusses: 2 by 6 inches nominal for both top and bottom chords.

D. Minimum Specific Gravity for Top Chords: 0.50.

E. Permanent Bracing: Provide wood bracing that complies with requirements for miscellaneous lumber in Section 061000 "Rough Carpentry."

2.3 METAL CONNECTOR PLATES

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 Engineered Products, Inc.; an ITW company.
2. Cherokee Metal Products, Inc.; Masengill Machinery Company.
3. CompuTrus, Inc.
4. Eagle Metal Products.
5. Jager Building Systems, Inc.; a Tembec/SGF Rexfor company.
6. MiTek Industries, Inc.; a subsidiary of Berkshire Hathaway Inc.
7. Robbins Engineering, Inc.
8. Truswal Systems Corporation; an ITW company.

B. Source Limitations: Obtain metal connector plates from single manufacturer.

C. General: Fabricate connector plates to comply with TPI 1.

D. Hot-Dip Galvanized-Steel Sheet: ASTM A 653/A 653M; Structural Steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G60 coating designation; and not less than 0.036 inch thick.
1. Use for interior locations unless otherwise indicated.

E. Hot-Dip Heavy-Galvanized-Steel Sheet: ASTM A 653/A 653M; Structural Steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 coating designation; and not less than 0.036 inch thick.
1. Use for wood-preservative-treated lumber and where indicated.

F. Stainless-Steel Sheet: ASTM A 666, Type 304, and not less than 0.035 inch thick.
1. Use for exterior locations fire-retardant treated lumber, and where indicated.

2.4 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
1. Provide fasteners for use with metal framing anchors that comply with written recommendations of metal framing manufacturer.
2. Where trusses are exposed to weather, in ground contact, made from pressure-preservative treated wood, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

B. Nails, Brads, and Staples: ASTM F 1667.

2.5 METAL FRAMING ANCHORS AND ACCESSORIES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Basis-of-Design Product: Subject to compliance with requirements, provide or comparable product by one of the following:
1. Cleveland Steel Specialty Co.
2. KC Metals Products, Inc.
3. Phoenix Metal Products, Inc.
4. Simpson Strong-Tie Co., Inc.
5. USP Structural Connectors.

C. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

D. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 coating designation.
   1. Use for interior locations unless otherwise indicated.

E. Hot-Dip Heavy-Galvanized-Steel Sheet: ASTM A 653/A 653M; Structural Steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 coating designation; and not less than 0.036 inch thick.
   1. Use for wood-preservative-treated lumber and where indicated.

F. Stainless-Steel Sheet: ASTM A 666, Type 304.
   1. Use for exterior locations and where indicated.

G. Truss Tie-Downs: Bent strap tie for fastening roof trusses to wall studs below, 1-1/2 inches wide by 0.050 inch thick. Tie fastens to one side of truss, top plates, and side of stud below.

H. Truss Tie-Downs (Hurricane or Seismic Ties): Bent strap tie for fastening roof trusses to wall studs below, 2-1/4 inches wide by 0.062 inch thick. Tie fits over top of truss and fastens to both sides of truss, top plates, and one side of stud below.

I. Truss Tie-Downs (Hurricane or Seismic Ties): Bent strap tie for fastening roof trusses to wall studs below, 2-1/2 inches wide by 0.062 inch thick. Tie fits over top of truss and fastens to both sides of truss, inside face of top plates, and both sides of stud below.

J. Roof Truss Clips: Angle clips for bracing bottom chord of roof trusses at non-load-bearing walls, 1-1/4 inches wide by 0.050 inch thick. Clip is fastened to truss through slotted holes to allow for truss deflection.

K. Floor Truss Hangers: U-shaped hangers, full depth of floor truss, with 1-3/4-inch-long seat; formed from metal strap 0.062 inch thick with tabs bent to extend over and be fastened to supporting member.

L. Roof Truss Bracing/Spacers: U-shaped channels, 1-1/2 inches wide by 1 inch deep by 0.040 inch thick, made to fit between two adjacent trusses and accurately space them apart, and with tabs having metal teeth for fastening to trusses.

2.6 MISCELLANEOUS MATERIALS

A. Galvanizing Repair Paint: SSPC-Paint 20, with dry film containing a minimum of 94 percent zinc dust by weight.

B. Protective Coatings: SSPC-Paint 22, epoxy-polyamide primer or SSPC-Paint 16, coal-tar epoxy-polyamide paint.

2.7 FABRICATION

A. Cut truss members to accurate lengths, angles, and sizes to produce close-fitting joints.

B. Fabricate metal connector plates to sizes, configurations, thicknesses, and anchorage details required to withstand design loads for types of joint designs indicated.

C. Assemble truss members in design configuration indicated; use jigs or other means to ensure uniformity and accuracy of assembly with joints closely fitted to comply with tolerances in TPI 1. Position members to produce design camber indicated.
   1. Fabricate wood trusses within manufacturing tolerances in TPI 1.

D. Connect truss members by metal connector plates located and securely embedded simultaneously in both sides of wood members by air or hydraulic press.

2.8 SOURCE QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform special inspections.
   1. Provide special inspector with access to fabricator's documentation of detailed fabrication and quality-control procedures that provide a basis for inspection control of the workmanship and the fabricator's ability to conform to approved construction documents and referenced standards.
   2. Provide special inspector with access to places where wood trusses are being fabricated to perform inspections.

B. Correct deficiencies in Work that special inspections indicate does not comply with the Contract Documents.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install wood trusses only after supporting construction is in place and is braced and secured.

B. If trusses are delivered to Project site in more than one piece, assemble trusses before installing.

C. Hoist trusses in place by lifting equipment suited to sizes and types of trusses required, exercising care not to damage truss members or joints by out-of-plane bending or other causes.

D. Install and brace trusses according to TPI recommendations and as indicated.

E. Install trusses plumb, square, and true to line and securely fasten to supporting construction.

F. Space trusses as indicated; adjust and align trusses in location before permanently fastening.

G. Anchor trusses securely at bearing points; use metal truss tie-downs or floor truss hangers as applicable. Install fasteners through each fastener hole in metal framing anchors according to manufacturer's fastening schedules and written instructions.

H. Securely connect each truss ply required for forming built-up girder trusses.
   1. Anchor trusses to girder trusses as indicated.

I. Install and fasten permanent bracing during truss erection and before construction loads are applied. Anchor ends of permanent bracing where terminating at walls or beams.
   1. Install bracing to comply with Section 061000 "Rough Carpentry."
   2. Install and fasten strongback bracing vertically against vertical web of parallel-chord floor trusses at centers indicated.

J. Install wood trusses within installation tolerances in TPI 1.

K. Do not alter trusses in field. Do not cut, drill, notch, or remove truss members.

L. Replace wood trusses that are damaged or do not meet requirements.
   1. Damaged trusses may be repaired according to truss repair details signed and sealed by the qualified professional engineer responsible for truss design, when approved by Architect.

3.2 REPAIRS AND PROTECTION

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

B. Protect wood trusses from weather. If, despite protection, wood trusses become wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

C. Repair damaged galvanized coatings on exposed surfaces with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

END OF SECTION 061753

SECTION 072100 - THERMAL INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Extruded polystyrene foam-plastic board insulation.
2. Glass-fiber blanket insulation.
3. Mineral-wool blanket insulation.

B. Related Requirements:

1. Section 072119 "Foamed-in-Place Insulation" for spray-applied polyurethane foam insulation.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS

A. Installer's Certification: Listing type, manufacturer, and R-value of insulation installed in each element of the building thermal envelope.

1. Sign, date, and post the certification in a conspicuous location on Project site.

B. Product Test Reports: For each product, for tests performed by a qualified testing agency.

C. Research Reports: For foam-plastic insulation, from ICC-ES.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

B. Protect foam-plastic board insulation as follows:

1. Do not expose to sunlight except to necessary extent for period of installation and concealment.
2. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site until just before installation time.

3. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Surface-Burning Characteristics: Maximum flame-spread and smoke-developed indexes less than Class A, 25 and 450 when tested in accordance with ASTM E84.

B. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.

C. Labeling: Provide identification of mark indicating R-value of each piece of insulation **12 inches** and wider in width.

D. Thermal-Resistance Value (R-Value): R-value as indicated on Drawings in accordance with ASTM C518.

2.2 EXTRUDED POLYSTYRENE FOAM-PLASTIC BOARD INSULATION (XPS)

A. Extruded Polystyrene Board Insulation, Type IV: ASTM C578, Type IV, **25 psi** minimum compressive strength; unfaced.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. DiversiFoam Products
b. DuPont de Nemours, Inc.
c. Kingspan Insulation LLC
d. Owens Corning
e. The Dow Chemical Company

2.3 GLASS-FIBER BLANKET INSULATION

A. Glass-Fiber Blanket Insulation, Unfaced: ASTM C665, Type I; passing ASTM E136 for combustion characteristics.

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. CertainTeed; SAINT-GOBAIN
b. Johns Manville; a Berkshire Hathaway company
c. Knauf Insulation
d. Owens Corning

B. Glass-Fiber Blanket Insulation, Kraft Faced: ASTM C665, Type II (nonreflective faced), Class C (faced surface not rated for flame propagation); Category 1 (membrane is a vapor barrier).

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. CertainTeed; SAINT-GOBAIN
b. Johns Manville; a Berkshire Hathaway company
c. Knauf Insulation
d. Owens Corning

2.4 MINERAL-WOOL BLANKET INSULATION

A. Mineral-Wool Blanket Insulation, Unfaced: ASTM C665, Type I (blankets without membrane facing); consisting of fibers; complying with ASTM E136 for combustion characteristics.

2.5 INSULATION FASTENERS

A. Insulation Fastener Accessories: Provide double-pointed weld pins, lagging pins, quilting pins, duct liner pins, insulation hangers, specialty washers, special caps, j-hooks, capacitor discharge annular weld pins, capacitor discharge acoustical lagging pins, and other accessory materials that are recommended in writing by insulation fastener manufacturer to produce complete insulation supports.

2.6 ACCESSORIES

A. Insulation for Miscellaneous Voids:

1. Glass-Fiber Insulation: ASTM C764, Type II, loose fill; with maximum flame-spread and smoke-developed indexes of 5, per ASTM E84.
2. Spray Polyurethane Foam Insulation: ASTM C1029, Type II, closed cell, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E84.

B. Miscellaneous Application Accessories:

1. Adhesive for Bonding Insulation: Product compatible with insulation and air and water barrier materials, and with demonstrated capability to bond insulation securely to substrates without damaging insulation and substrates.
2. Crack Sealer: Closed-cell insulating foam in aerosol dispenser recommended in writing by insulation manufacturer for filling gaps in board insulation.
3. Eave Ventilation Troughs: Preformed, rigid fiberboard or plastic sheets designed and sized to fit between roof framing members and to provide ventilation between insulated attic spaces and vented eaves.
4. Detailing Foam Insulation for Voids: Urethane foam complying with AAMA 812, low expansion pressure suitable for filling insulation gaps and voids adjacent to openings to

protect against water, air, and sound intrusion.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean substrates of substances that are harmful to insulation, including removing projections capable of puncturing insulation or vapor retarders, or those that interfere with insulation attachment.

3.2 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products, applications and applicable codes.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

C. Install insulation with manufacturer's R-value label exposed after insulation is installed.

D. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

E. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

3.3 INSTALLATION OF FOUNDATION WALL INSULATION

A. Butt panels together for tight fit.

B. Anchor Installation: Install board insulation on concrete substrates by adhesively attached, spindle-type insulation anchors as follows:

1. Fasten insulation anchors to concrete substrates with insulation anchor adhesive in accordance with anchor manufacturer's written instructions.
2. Space anchors in accordance with insulation manufacturer's written instructions for insulation type, thickness, and application.
3. Apply insulation standoffs to each spindle to create cavity width indicated on Drawings between concrete substrate and insulation.
4. After adhesive has dried, install board insulation by pressing insulation into position over spindles and securing it tightly in place with insulation-retaining washers, taking care not to compress insulation.
5. Where insulation will not be covered by other building materials, apply capped washers to tips of spindles.

C. Adhesive Installation: Install with adhesive or press into tacky waterproofing or dampproofing in accordance with manufacturer's written instructions.

3.4 INSTALLATION OF CAVITY-WALL INSULATION

A. Foam-Plastic Board Insulation: Install pads of adhesive spaced approximately **24 inches** o.c. both ways on inside face and as recommended in writing by manufacturer.

1. Fit courses of insulation between wall ties and other obstructions, with edges butted tightly in both directions, and with faces flush.
2. Press units firmly against inside substrates.
3. Supplement adhesive attachment of insulation by securing boards with two-piece wall ties designed for this purpose and specified in Section 042000 "Unit Masonry."

3.5 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

A. Blanket Insulation: Install in cavities formed by framing members in accordance with the following requirements:

1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
3. Maintain **3-inch** clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
4. Attics: Install eave ventilation troughs between roof framing members in insulated attic spaces at vented eaves.
5. For metal-framed wall cavities where cavity heights exceed **96 inches**, support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.
6. Where glass-fiber blankets are indicated for sound attenuation above ceilings, install unfaced blanket insulation over ceiling area in thickness indicated. Where partitions occur, extend insulation up either side of partition.
7. For wood-framed construction, install blankets in accordance with ASTM C1320 and as follows:

    a. With faced blankets having stapling flanges, lap blanket flange over flange of adjacent blanket to maintain continuity of vapor retarder once finish material is installed over it.

B. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:

1. Glass-Fiber Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately **2.5 lb/cu. ft.**.
2. Detailing Foam Insulation for Voids: Apply in accordance with manufacturer's written

instructions.

3.6 INSTALLATION OF BOARD INSULATION

A. Install board insulation in accordance with manufacturer's written instructions per project applications and conditions.

3.7 PROTECTION

A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes.

B. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 072100

SECTION 072119 - FOAMED-IN-PLACE INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Closed-cell spray polyurethane foam insulation.

B. Related Requirements:

1. Section 072100 "Thermal Insulation" for foam-plastic board insulation.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS

A. Field quality control reports.

B. Qualification Statements: For Installer.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

PART 2 - PRODUCTS

2.1 CLOSED-CELL SPRAY POLYURETHANE FOAM INSULATION

A. Closed-Cell Spray Polyurethane Foam: ASTM C1029.

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. AMBIT Polyurethane
b. Carlisle Spray Foam Insulation; a Carlisle Company
c. Enverge, Amrize Building Envelope LLC
d. Gaco; Amrize Building Envelope LLC

e. Henry; a Carlisle Company
f. Huntsman Building Solutions
g. Johns Manville; a Berkshire Hathaway company
h. NCFI Polyurethanes; a division of Barnhardt Manufacturing Company
i. Quadrant Performance Materials
j. SWD Urethane Company
k. Thermoseal USA
l. Volatile Free, Inc.

2. Type and Minimum Compressive Strength:

a. Type II, minimum density of 1.5 lb/cu. ft. and minimum aged R-value at **1-inch** thickness of **6.2 deg F x h x sq. ft./Btu at 75 deg F**.

3. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

a. Flame-Spread Index: 25 or less.
b. Smoke-Developed Index: 450 or less.
c. Fire-Propagation Characteristics: Passes NFPA 285 and NFPA 276 testing as part of an approved assembly.

4. Fire-Safety Barriers: Approved assembly as thermal barrier and ignition barrier with accessory components.

2.2 ACCESSORIES

A. Prescriptive Thermal Barriers: Building-code-approved materials.

1. Gypsum Board: **1/2-inch** minimum thickness.

B. Prescriptive Ignition Barriers: Building-code-approved materials.

1. Gypsum Wallboard: **0.325-inch** minimum thickness.

PART 3 - EXECUTION

3.1 PREPARATION

A. Verify that substrates are clean, dry, and free of substances that are harmful to insulation.

B. Priming: Prime substrates where recommended by insulation manufacturer. Apply primer to comply with insulation manufacturer's written instructions. Confine primers to areas to be insulated; do not allow spillage or migration onto adjoining surfaces.

3.2 INSTALLATION OF FOAMED-IN-PLACE INSULATION

A. Comply with insulation manufacturer's written instructions applicable to products and applications.

B. Spray insulation to envelop entire area to be insulated and fill voids.

C. Apply in multiple passes to not exceed maximum thicknesses recommended by manufacturer. Do not spray into rising foam.

D. Framed Construction: Install into cavities formed by framing members to achieve thickness indicated on Drawings.

E. Cavity Walls: Install into cavities to fully fill void.

F. Miscellaneous Voids: Apply according to manufacturer's written instructions.

G. Install ignition barrier material.

1. Do not cover insulation prior to any required spray foam insulation inspections.

H. Apply barrier coatings in accordance with manufacturer's written instructions and to comply with requirements for listing and labeling for fire-propagation characteristics and surface-burning characteristics specified.

1. Use equipment and techniques best suited for substrate and type of material applied as recommended by coating manufacturer.
2. Apply coatings to prepared surfaces as soon as practical after preparation and before subsequent surface soiling or deterioration.
3. Apply coatings to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Produce sharp lines and color breaks.

3.3 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect spray foam insulation installation, including accessories. Report results in writing.

3.4 PROTECTION

A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes.

END OF SECTION 072119

SECTION 072726 - FLUID-APPLIED MEMBRANE AIR BARRIERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Vapor-permeable, fluid-applied air barriers.

1.2 DEFINITIONS

A. Air-Barrier Material: A primary element that provides a continuous barrier to the movement of air.

B. Air-Barrier Accessory: A transitional component of the air barrier that provides continuity.

C. Air-Barrier Assembly: The collection of air-barrier materials and accessories applied to an opaque wall, including joints and junctions to abutting construction, to control air movement through the wall.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include manufacturer's written instructions for evaluating, preparing, and treating each substrate; technical data; dry film thickness; and tested physical and performance properties of products.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1. Installer to be licensed by ABAA according to ABAA's Quality Assurance Program and to employ ABAA-certified installers and supervisors on Project.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Remove and replace liquid materials that cannot be applied within their stated shelf life.

B. Protect stored materials from direct sunlight.

1.6 FIELD CONDITIONS

A. Environmental Limitations: Apply air barrier within the range of ambient and substrate temperatures recommended in writing by air-barrier manufacturer.

1. Protect substrates from environmental conditions that affect air-barrier performance.
2. Do not apply air barrier to a damp or wet substrate or during snow, rain, fog, or mist.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Air-Barrier Performance: Air-barrier assembly and seals with adjacent construction to be capable of performing as a continuous air barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. Air-barrier assemblies to be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations , tie-ins to installed waterproofing, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.

B. Air-Barrier Assembly Air Leakage: Maximum 0.04 cfm/sq. ft. of surface area at 1.57 lbf/sq. ft., when tested according to ASTM E2357.

2.2 HIGH-BUILD AIR BARRIERS, VAPOR PERMEABLE

A. Physical and Performance Properties:

1. Air Permeance: Maximum 0.004 cfm/sq. ft. of surface area at 1.57-lbf/sq. ft. pressure difference; ASTM E2178.
2. Vapor Permeance: Minimum 5 perms; ASTM E96/E96M, Procedure A, Desiccant Method.
3. Ultimate Elongation: Minimum 200 percent; ASTM D412, Die C.
4. Adhesion to Substrate: Minimum 16 lbf/sq. in. when tested according to ASTM D4541.
5. UV Resistance: Can be exposed to sunlight for 30 days according to manufacturer's written instructions.

2.3 ACCESSORY MATERIALS

A. Provide primers, transition strips, termination strips, joint reinforcing fabric and strips, joint sealants, counterflashing strips, flashing sheets and metal termination bars, termination mastic, substrate patching materials, adhesives, tapes, foam sealants, lap sealants, and other accessory materials that are recommended in writing by air-barrier manufacturer to produce a complete air-barrier assembly and that are compatible with primary air-barrier material and adjacent construction to which they may seal.

B. Primer: Liquid waterborne or solvent-borne primer recommended for substrate by air-barrier material manufacturer.

C. Stainless Steel Sheet: ASTM A240/A240M, Type 304, 0.0187 inch thick, and Series 300 stainless steel fasteners.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

1. Verify that substrates are sound and free of oil, grease, dirt, excess mortar, or other contaminants.
2. Verify that substrates have cured and aged for minimum time recommended in writing by air-barrier manufacturer.
3. Verify that substrates are visibly dry and free of moisture.
4. Verify that masonry joints are flush and completely filled with mortar.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

A. Clean, prepare, treat, fill, and seal substrate and joints and cracks in substrate according to manufacturer's written instructions and details. Provide clean, dust-free, and dry substrate for air-barrier application.

B. Mask off adjoining surfaces not covered by air barrier to prevent spillage and overspray affecting other construction.

C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.

D. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids in concrete with substrate-patching material.

E. Remove excess mortar from masonry ties, shelf angles, and other obstructions.

F. At changes in substrate plane, apply sealant or termination mastic beads at sharp corners and edges to form a smooth transition from one plane to another.

G. Cover gaps in substrate plane and form a smooth transition from one substrate plane to another with stainless steel sheet mechanically fastened to structural framing to provide continuous support for air barrier.

H. Bridge isolation joints discontinuous wall-to-wall, deck-to-wall, and deck-to-deck joints with

air-barrier accessory material that accommodates joint movement according to manufacturer's written instructions and details.

3.3 ACCESSORIES INSTALLATION

A. Install accessory materials according to air-barrier manufacturer's written instructions and details to form a seal with adjacent construction and ensure continuity of air and water barrier.

1. Coordinate the installation of air barrier with installation of roofing membrane and base flashing to ensure continuity of air barrier with roofing membrane.
2. Install transition strip on roofing membrane or base flashing so that a minimum of **3 inches** of coverage is achieved over each substrate.
3. Unless manufacturer recommends in writing against priming, apply primer to substrates at required rate and allow it to dry.
4. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by air-barrier material on same day. Reprime areas exposed for more than 24 hours.

B. Connect and seal exterior wall air-barrier material continuously to roofing-membrane air barrier, concrete below-grade structures, floor-to-floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.

C. At end of each working day, seal top edge of strips and transition strips to substrate with termination mastic.

D. Apply joint sealants forming part of air-barrier assembly within manufacturer's recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

E. Fill gaps in perimeter frame surfaces of windows, curtain walls, storefronts, and doors, and miscellaneous penetrations of air-barrier material with foam sealant.

F. Seal strips and transition strips around masonry reinforcing or ties and penetrations with termination mastic.

G. Seal top of through-wall flashings to air barrier with an additional **6-inch-** wide, transition strip.

H. Seal exposed edges of strips at seams, cuts, penetrations, and terminations not concealed by metal counterflashings or ending in reglets with termination mastic.

I. Repair punctures, voids, and deficient lapped seams in strips and transition strips. Slit and flatten fishmouths and blisters. Patch with transition strips extending **6 inches** beyond repaired areas in strip direction.

3.4 PRIMARY AIR-BARRIER MATERIAL INSTALLATION

A. Apply air-barrier material to form a seal with strips and transition strips and to achieve a continuous air barrier according to air-barrier manufacturer's written instructions and details. Apply air-barrier material within manufacturer's recommended application temperature ranges.

1. Unless manufacturer recommends in writing against priming, apply primer to substrates at required rate and allow it to dry.
2. Limit priming to areas that will be covered by air-barrier material on same day. Reprime areas exposed for more than 24 hours.
3. Where multiple prime coats are needed to achieve required bond, allow adequate drying time between coats.

B. High-Build Air Barriers: Apply continuous unbroken air-barrier material to substrates according to the following thickness. Apply air-barrier material in full contact around protrusions such as masonry ties.

1. Vapor-Permeable, High-Build Air Barrier: Total dry film thickness as recommended in writing by manufacturer to comply with performance requirements, but not less than 35 mils, applied in one or more equal coats.

C. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air-barrier components.

3.5 FIELD QUALITY CONTROL

A. Repair damage to air barriers caused by testing; follow manufacturer's written instructions.

3.6 CLEANING AND PROTECTION

A. Protect air-barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.

1. Protect air barrier from exposure to UV light and harmful weather exposure as recommended in writing by manufacturer. If exposed to these conditions for longer than recommended, remove and replace air barrier or install additional, full-thickness, air-barrier application after repairing and preparing the overexposed materials according to air-barrier manufacturer's written instructions.
2. Protect air barrier from contact with incompatible materials and sealants not approved by air-barrier manufacturer.

B. Clean spills, stains, and soiling from construction that would be exposed in the completed work using cleaning agents and procedures recommended in writing by manufacturer of affected construction.

C. Remove masking materials after installation.

END OF SECTION 072726

SECTION 073113 - ASPHALT SHINGLES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Glass-fiber-reinforced asphalt shingles.
2. Metal flashing and trim.

1.2 DEFINITIONS

A. Roofing Terminology: See ASTM D1079 for definitions of terms related to roofing Work in this Section.

1.3 ACTION SUBMITTALS

A. Product Data: For the following:

1. Asphalt shingles.
2. Asphalt roofing cement.
3. Elastomeric flashing sealant.

B. Samples: For each exposed product and for each color and blend specified, in sizes indicated.

1. Asphalt Shingles: Full size.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Test Reports: For each type of asphalt shingle and underlayment product indicated, for tests performed by manufacturer and witnessed by a qualified testing agency.

C. Research Reports: For synthetic underlayment, from an agency acceptable to authorities having jurisdiction, indicating that product is suitable for intended use under applicable building codes.

D. Sample Warranty: For manufacturer's materials warranty.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For asphalt shingles to include in maintenance manuals.

B. Materials warranties.

C. Roofing Installer's warranty.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Asphalt Shingles: 100 sq. ft. of each type and in each color and blend, in unbroken bundles.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An authorized installer who is trained and approved by manufacturer.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store roofing materials in a dry, well-ventilated location protected from weather, sunlight, and moisture in accordance with manufacturer's written instructions.

B. Store underlayment rolls on end, on pallets or other raised surfaces. Do not double-stack rolls.

C. Protect unused roofing materials from weather, sunlight, and moisture when left overnight or when roofing Work is not in progress.

D. Handle, store, and place roofing materials in a manner to prevent damage to roof deck or structural supporting members.

1.9 FIELD CONDITIONS

A. Environmental Limitations: Proceed with installation only when existing and forecasted weather conditions permit product installation and related Work to be performed in accordance with manufacturer's written instructions and warranty requirements.

1. Install self-adhering, polymer-modified bitumen sheet underlayment within the range of ambient and substrate temperatures recommended in writing by manufacturer.

1.10 WARRANTY

A. Materials Warranty: Manufacturer agrees to repair or replace asphalt shingles that fail within

specified warranty period.

1. Failures include, but are not limited to, the following:

    a. Manufacturing defects.

2. Materials Warranty Period: 40 years from date of Substantial Completion, prorated, with first 10 years nonprorated.
3. Wind-Speed Warranty Period: Asphalt shingles will resist blow-off or damage caused by wind speeds of up to 150 mph for 15 years from date of Substantial Completion.
4. Algae-Resistance Warranty Period: Asphalt shingles will not discolor for 15 years from date of Substantial Completion.
5. Workmanship Warranty Period: 20 years from date of Substantial Completion.

B. Roofing Installer's Warranty: On warranty form at end of this Section, signed by Installer, in which Installer agrees to repair or replace components of asphalt shingle roofing that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain each type of product from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Exterior Fire-Test Exposure: Provide asphalt shingles and related roofing materials identical to those of assemblies tested for Class A fire resistance in accordance with ASTM E108 or UL 790 by Underwriters Laboratories or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.

B. Wind Resistance: Provide asphalt shingles that comply with requirements of ASTM D3161/D3161M, Class F, and with ASTM D7158/D7158M, Class H.

2.3 GLASS-FIBER-REINFORCED ASPHALT SHINGLES

A. Impact-Resistant, Laminated-Strip Asphalt Shingles: ASTM D3462/D3462M, laminated, multi-ply overlay construction; glass-fiber reinforced, mineral-granule surfaced, and self-sealing; with impact resistance complying with UL 2218, Class 4.

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. Atlas Molded Products, a division of Atlas Roofing Corporation
b. CertainTeed; SAINT-GOBAIN
c. GAF

2. Butt Edge: Straight cut.
3. Strip Size: Manufacturer's standard.
4. Algae Resistance: Granules resist algae discoloration.
5. Color and Blends: As selected by Architect from manufacturer's full range.

B. Hip and Ridge Shingles: Manufacturer's standard units to match asphalt shingles.

2.4 UNDERLAYMENT MATERIALS

A. Organic Felt: Asphalt-saturated organic felts, nonperforated and complying with the following:

1. ASTM D226/D226M: Type II.

B. Roof Deck Seam Tape

1. ASTM D1970-compliant self-adhering polymer-modified bitumen flashing tape, at least 4 in wide.

2.5 ACCESSORIES

A. Asphalt Roofing Cement: ASTM D4586/D4586M Type II, asbestos free.

B. Elastomeric Flashing Sealant: ASTM C920, Type S, Grade NS, one-part, non-sag, elastomeric polymer sealant; of class and use classifications required to seal joints and remain watertight; recommended in writing by manufacturer for installation of flashing systems.

C. Roofing Nails: ASTM F1667, aluminum, stainless steel, copper, or hot-dip galvanized-steel wire shingle nails, minimum **0.120-inch-** diameter, sharp-pointed, with a **3/8- to 7/16-inch-** diameter flat head and of sufficient length to penetrate **3/4 inch** into solid wood decking or extend at least **1/8 inch** through sheathing less than **3/4 inch** thick.

1. Where nails are in contact with metal flashing, use nails made from same metal as flashing.

D. Underlayment Nails: Aluminum, stainless steel, or hot-dip galvanized-steel wire nails with low-profile metal or plastic caps, **1-inch-** minimum diameter.

1. Provide with minimum **0.0134-inch-** thick metal cap, **0.010-inch-** thick power-driven metal cap, or **0.035-inch-** thick plastic cap; and with minimum **0.083-inch-** thick ring shank of length to penetrate at least **3/4 inch** into roof sheathing or to penetrate through roof sheathing less than **3/4 inch** thick.

2.6 METAL FLASHING AND TRIM

A. Comply with requirements in Section 076200 "Sheet Metal Flashing and Trim."

1. Sheet Metal: Stainless steel Anodized aluminum.

B. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of the item unless otherwise specified in this Section or indicated on Drawings.

1. Drip Edges: Fabricate in lengths not exceeding 10 feet with minimum **2-inch** roof-deck flange and **1-1/2-inch** fascia flange with **3/8-inch** drip at lower edge.
2. Vent-Pipe Flashings: ASTM B749, Type L51121, at least **1/16 inch** thick. Provide lead sleeve sized to slip over and turn down into pipe, soldered to skirt at slope of roof, and extending at least **4 inches** from pipe onto roof.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

1. Examine roof sheathing to verify that sheathing joints are supported by framing and blocking or metal clips and that installation is within flatness tolerances.
2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored and that provisions have been made for flashings and penetrations through asphalt shingles.
3. Verify that vent stacks and other penetrations through roofing are installed and securely fastened.

B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF UNDERLAYMENT MATERIALS

A. Comply with asphalt shingle and underlayment manufacturers' written installation instructions and with recommendations in NRCA's "The NRCA Roofing Manual: Steep-Slope Roof Systems" applicable to products and applications indicated unless more stringent requirements are specified in this Section or indicated on Drawings.

B. Roof Deck Seam Tape: Install directly to roof deck to seal all horizontal and vertical joints in the roof deck. Fully adhere without voids. Follow manufacturer's recommendations for

installation. Apply manufacturer's recommended primer to roof deck, as necessary, to insure full adhesion.

C. Asphalt-Saturated Felt: Install on roof deck parallel with and starting at eaves and fasten with underlayment nails.

1. Single-Layer Installation:

a. Lap sides a minimum of 4 inches over underlying course.
b. Lap ends a minimum of **6 inches**.
c. Stagger end laps between succeeding courses at least **72 inches**.

2. Install fasteners in a grid pattern of **12 inches** between side laps with **6-inch** spacing at side and end laps.
3. Terminate felt extended up not less than 4 inches against sidewalls, curbs, chimneys, and other roof projections.

3.3 INSTALLATION OF METAL FLASHING AND TRIM

A. Install metal flashings and trim to comply with requirements in Section 076200 "Sheet Metal Flashing and Trim."

1. Install metal flashings in accordance with recommendations in NRCA's "NRCA Guidelines for Asphalt Shingle Roof Systems."
2. Bed flanges of metal flashings using asphalt roofing cement or elastomeric flashing sealant.

B. Rake Drip Edges: Install over underlayment materials and fasten to roof deck. Seal the drip edge, underlayment and starter strip by applying an 8-in. wide layer of compatible flashing cement, max. thickness 1/8", over the drip edge and adjacent underlayment.

C. Eave Drip Edges: Install over underlayment materials and fasten to roof deck. Seal the drip edge, underlayment and starter strip by applying an 8-in. wide layer of compatible flashing cement, max. thickness 1/8", over the drip edge and adjacent underlayment.

D. Pipe Flashings: Form flashing around pipe penetrations and asphalt shingles. Fasten and seal to asphalt shingles as recommended by manufacturer.

3.4 INSTALLATION OF ASPHALT SHINGLES

A. Install asphalt shingles in accordance with manufacturer's written instructions and recommendations in NRCA's "NRCA Guidelines for Asphalt Shingle Roof Systems."

B. Install starter strip along lowest roof edge, consisting of an asphalt shingle strip at least 7 inches wide with self-sealing strip face up at roof edge.

1. Extend asphalt shingles 1/4 inch over fasciae at eaves and rakes.

2. Install starter strip along rake edge.

C. Install first and remaining courses of laminated asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.

D. Fasten asphalt shingle strips with a minimum of four roofing nails, but not less than the number indicated in manufacturer's written instructions for roof slope and design wind speed indicated on Drawings and for warranty requirements specified in this Section.

1. Locate fasteners in accordance with manufacturer's written instructions.
2. When ambient temperature during installation is below 50 deg F, hand seal self-sealing asphalt shingles by applying asphalt roofing cement spots between course overlaps after nailing the upper course.

E. Closed-Cut Valleys: Extend asphalt shingle strips from one side of valley 12 inches beyond center of valley.

1. Use one-piece shingle strips without joints in valley.
2. Fasten with extra nail in upper end of shingle. Install asphalt shingle courses from other side of valley and cut back to a straight line **2 inches** short of valley centerline.
3. Trim upper concealed corners of cut-back shingle strips.
4. Do not nail asphalt shingles within **6 inches** of valley center.
5. Set trimmed, concealed-corner asphalt shingles in a **3-inch-** wide bed of asphalt roofing cement.

F. Hip and Ridge Shingles: Maintain same exposure of cap shingles as roofing-shingle exposure. Lap cap shingles at ridges to shed water away from direction of prevailing winds.

1. Fasten with roofing nails of sufficient length to penetrate sheathing.

END OF SECTION 073113

SECTION 074616 - ALUMINUM SIDING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Aluminum soffit.

B. Related Requirements:

1. Section 061000 "Rough Carpentry" for wood furring, grounds, nailers, and blocking.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples for Initial Selection: For aluminum soffit and components including related accessories.

C. Samples for Verification: Actual sample of finished products for each type, color, texture, and pattern required.

1. Size: Manufacturers' standard size.

1.3 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of product, including related accessories.

B. Warranty Documentation:

1. Manufacturers' special warranties.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Extra Stock Material: Furnish extra materials to Owner that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Furnish full lengths of aluminum soffit and components including related accessories, in a quantity equal to 20 LF.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store packaged materials in original containers with labels intact until time of use.

B. Store and protect materials on elevated platforms, under cover, and in a dry location.

1.6 COORDINATION

A. Coordinate siding installation with flashings and other adjoining construction to ensure proper sequencing.

1.7 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace products that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures, including cracking , fading, and deforming.
b. Deterioration of metals, metal finishes, and other materials beyond weathering.

2. Fading is defined as loss of color, after cleaning with product recommended in writing by manufacturer, of more than 5 Hunter color-difference units as measured in accordance with ASTM D2244.
3. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain products, including related accessories, from single source from single manufacturer.

2.2 ALUMINUM SOFFIT

A. Aluminum Soffit: Formed and coated product complying with AAMA 1402.

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. Architectural Metal Solutions
b. Gentek Building Products, Inc
c. Kaycan Ltd
d. Mastic; Ply Gem
e. Norandex

f. Rollex Corporation

2. Pattern:

a. 12-inch exposure in V-grooved, double, 6-inch board style.

3. Texture: Smooth.
4. Ventilation: Provide unperforated soffit .
5. Nominal Thickness: 0.024 inch.
6. Related Materials: Provide starter strips, edge trim, outside and inside corner caps, and other items as recommended in writing by siding manufacturer for building configuration.

a. Provide accessories made from same material as adjacent siding unless otherwise indicated.

7. Fasteners:

a. For fastening to wood, use siding nails of sufficient length to penetrate a minimum of 1 inch into substrate.
b. For fastening to metal, use ribbed bugle-head screws of sufficient length to penetrate a minimum of 1/4 inch, or three screw-threads, into substrate.
c. For fastening aluminum, use aluminum fasteners. Where fasteners are exposed to view, use prefinished aluminum fasteners in color to match item being fastened.

8. Finish: Manufacturer's standard AAMA 2603.

a. Colors: As selected by Architect from manufacturer's full range of colors.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of aluminum soffit and components and related accessories.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrates of projections and substances detrimental to application.

3.3 ADJUSTING AND CLEANING

A. Remove damaged, improperly installed, or otherwise defective materials and replace with new materials complying with specified requirements.

B. Clean finished surfaces in accordance with manufacturer's written instructions and maintain in a clean condition during construction.

END OF SECTION 074616

SECTION 077100 - ROOF SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Manufactured units for the following applications:

1. Roof-edge drainage systems.

B. Related Requirements:

1. Section 042000 "Unit Masonry" for installing embedded reglets and for masonry through-wall flashing with receiver for counterflashing.
2. Section 079200 "Joint Sealants" for field-applied sealants between roof specialties and adjacent materials.

1.2 ACTION SUBMITTALS

A. Shop Drawings: For roof specialties.

1. Plans, expansion-joint locations, keyed details, and attachments to other work. Distinguish between factory pre manufactured- and field-assembled installation.
2. Details for expansion and contraction; locations of expansion joints, including direction of expansion and contraction.
3. Indicate profile and pattern of seams and layout of fasteners, cleats, clips, and other attachments.
4. Details of termination points and assemblies, including fixed points.
5. Details of special conditions.

B. Samples: For each type of roof specialty and for each color and texture specified.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Do not store roof specialties in contact with other materials that might cause staining, denting, or other surface damage. Store roof specialties away from uncured concrete and masonry.

B. Protect strippable protective covering on roof specialties from exposure to sunlight and high humidity, except to extent necessary for the period of roof-specialty installation.

1.4 FIELD CONDITIONS

A. Field Measurements: Verify profiles and tolerances of roof-specialty substrates by field measurements before fabrication, and indicate measurements on Shop Drawings.

1.5 COORDINATION

A. Coordinate roof specialties with roofing system, exterior wall system, air barrier, flashing, trim, and construction of parapets, roof deck, roof and wall panels, and other adjoining work to provide a leakproof, weathertight, secure, and noncorrosive installation.

1. Performance Coordination: Coordinate with the Work of roofing and exterior wall Sections to ensure that roof specialties provided under the Work of this Section meet or exceed specified roofing and exterior wall design performance requirements.

B. Confirm and coordinate compatibility of materials and comply with warranty requirements of roofing system manufacturer.

C. Coordinate roof specialties layout and seams with sizes and locations of joints and seams in adjacent materials.

1.6 WARRANTY

A. Special Warranty on Painted Finishes: Manufacturer agrees to repair finishes or replace roof specialties that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.
b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General Performance: Roof specialties to withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.

B. SPRI Wind Design Standard: Manufacture and install roof-edge specialties tested in accordance with ANSI/SPRI/FM 4435/ES-1 and capable of resisting the following design pressures:

1. Design Pressure: As indicated on Drawings.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that

resist rotation and avoid shear stress as a result of thermal movements. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 ROOF-EDGE DRAINAGE SYSTEMS

A. Gutters: Field-formed, seamless gutters , with matching corner units, ends, outlet tubes, and other accessories. Elevate back edge at least **1 inch** above front edge. Furnish flat-stock gutter straps, gutter brackets, expansion joints, and expansion-joint covers fabricated from same metal as gutters.

1. Formed Aluminum Sheet: 0.032 inch thick.
2. Gutter Size: 6-inch.
3. Gutter Profile: Style K in accordance with SMACNA's "Architectural Sheet Metal Manual."
4. Gutter Supports: Gutter brackets with finish matching the gutters.
5. Gutter Accessories: Wire ball downspout strainer.

B. Downspouts: Corrugated rectangular complete with machine-crimped elbows, manufactured from the following exposed metal. Furnish with metal hangers, from same material as downspouts, and anchors.

1. Formed Aluminum Sheet: 0.032 inch thick.
2. Size: 4-inch x 5-inch.

C. Finishes:

1. Aluminum: Two-coat fluoropolymer.

a. Color: As selected by Architect from manufacturer's full range.

2.3 MISCELLANEOUS MATERIALS

A. Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.

B. Fasteners: Roof specialty manufacturer's recommended fasteners, designed to meet performance requirements, suitable for application and metals being fastened. Match finish of exposed fasteners with finish of material being fastened. Provide nonremovable fastener heads to exterior exposed fasteners. Furnish the following unless otherwise indicated:

1. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.

C. Asphalt Roofing Cement: ASTM D4586, asbestos free, of consistency required for application.

2.4 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM/NOMMA AMP 500, "Metal Finishes Manual for Architectural and Metal Products," for recommendations for applying and designating finishes.

B. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.

B. Examine walls, roof edges, and parapets for suitable conditions for roof specialties.

C. Verify that substrate is sound, dry, smooth, clean, sloped for drainage where applicable, and securely anchored.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Install roof specialties in accordance with manufacturer's written instructions. Anchor roof specialties securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, underlayments, sealants, and other miscellaneous items as required to complete roof-specialty systems.

1. Install roof specialties level, plumb, true to line and elevation; with limited oil-canning and without warping, jogs in alignment, buckling, or tool marks.
2. Provide uniform, neat seams with minimum exposure of solder and sealant.
3. Install roof specialties to fit substrates and to result in weathertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.
4. Do not use graphite pencils to mark metal surfaces.

B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer's written installation instructions.

1. Coat concealed side of uncoated aluminum roof specialties with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
2. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof specialties for waterproof performance.

C. Expansion Provisions: Allow for thermal expansion of exposed roof specialties.

1. When ambient temperature at time of installation is between **40 and 70 deg F**, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures.

D. Fastener Sizes: Use fasteners of sizes that penetrate wood blocking or sheathing not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws.

E. Seal concealed joints with butyl sealant as required by roof specialty manufacturer.

F. Seal joints as required for weathertight construction. Place sealant to be completely concealed in joint. Do not install sealants at temperatures below **40 deg F**.

3.3 INSTALLATION OF ROOF-EDGE DRAINAGE SYSTEMS

A. Install components to produce a complete roof-edge drainage system in accordance with manufacturer's written instructions. Coordinate installation of roof perimeter flashing with installation of roof-edge drainage system.

B. Gutters: Join and seal gutter lengths. Allow for thermal expansion. Attach gutters to firmly anchored gutter supports spaced not more than 24 inches apart. Attach ends with rivets and seal with sealant to make watertight. Slope to downspouts.

C. Downspouts: Join sections with manufacturer's standard telescoping joints. Provide hangers with fasteners designed to hold downspouts securely to walls and **1 inch** away from walls; locate fasteners at top and bottom and at approximately 60 inches o.c.

1. Provide elbows at base of downspouts at grade to direct water away from building.

3.4 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films as roof specialties are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain roof specialties in a clean condition during construction.

B. Replace roof specialties that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures, as determined by Architect.

END OF SECTION 077100

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Nonstaining silicone joint sealants.
2. Latex joint sealants.

1.2 ACTION SUBMITTALS

A. Product Data:

1. Nonstaining silicone joint sealants.
2. Latex joint sealants.

B. Samples for Initial Selection: Manufacturer's standard color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

1.3 INFORMATIONAL SUBMITTALS

A. Sample warranties.

1.4 CLOSEOUT SUBMITTALS

A. Manufacturers' special warranties.

1.5 MOCKUPS

A. Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

1.6 FIELD CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
2. When joint substrates are wet.

3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.7 WARRANTY

A. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

B. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:

1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
2. Disintegration of joint substrates from causes exceeding design specifications.
3. Mechanical damage caused by individuals, tools, or other outside agents.
4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain joint sealants from single manufacturer for each sealant type.

2.2 JOINT SEALANTS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.3 NONSTAINING SILICONE JOINT SEALANTS

A. Nonstaining Joint Sealants: No staining of substrates when tested in accordance with ASTM C1248.

B. Silicone, Nonstaining, S, NS, 100/50, NT: Nonstaining, single-component, nonsag, plus 100 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 100/50, Use NT.

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. Pecora Corporation
    b. Sika Corporation - Building Components
    c. Tremco Incorporated

2.4 MILDEW-RESISTANT JOINT SEALANTS

A. Mildew-Resistant Joint Sealants: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.

2.5 LATEX JOINT SEALANTS

A. Acrylic Latex: Acrylic latex or siliconized acrylic latex, ASTM C834, Type OP, Grade NF.

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. Franklin International
    b. Pecora Corporation
    c. Sherwin-Williams Company (The)
    d. The Pittsburgh Paints Company
    e. Tremco Incorporated

2.6 JOINT-SEALANT BACKING

A. Sealant Backing Material: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C1330, Type C (closed-cell material with a surface skin) Type B (bicellular material with a surface skin) or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.7 MISCELLANEOUS MATERIALS

A. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or

harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

B. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:

    a. Concrete.
    b. Masonry.
    c. Unglazed surfaces of ceramic tile.

3. Remove laitance and form-release agents from concrete.
4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:

    a. Metal.
    b. Glass.
    c. Porcelain enamel.
    d. Glazed surfaces of ceramic tile.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as

indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.

D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants in accordance with requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint profile in accordance with Figure 8A in ASTM C1193 unless otherwise indicated.

3.4 FIELD QUALITY CONTROL

A. Tests and Inspections:

1. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:

a. Extent of Testing: Test completed and cured sealant joints as follows:

1) Perform 10 tests for the first 1000 ft. of joint length for each kind of sealant and joint substrate.
2) Perform one test for each 1000 ft. of joint length thereafter or one test per each floor per elevation.

b. Test Method: Test joint sealants in accordance with Method A, Tail Procedure, in ASTM C1521.

1) For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

c. Inspect tested joints and report on the following:

1) Whether sealants filled joint cavities and are free of voids.
2) Whether sealant dimensions and configurations comply with specified requirements.
3) Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion complies with sealant manufacturer's field-adhesion hand-pull test criteria.

d. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant material, sealant configuration, and sealant dimensions.
e. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.

2. Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

B. Prepare test and inspection reports.

3.5 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION 079200

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Exterior standard steel doors and frames.

B. Related Requirements:

1. Section 087100 "Door Hardware" for door hardware for hollow-metal doors.

1.2 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings in accordance with NAAMM-HMMA 803 or ANSI/SDI A250.8.

1.3 COORDINATION

A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

B. Coordinate requirements for installation of door hardware, electrified door hardware, and access control and security systems.

1.4 ACTION SUBMITTALS

A. Product Data:

1. Exterior standard steel doors and frames.

B. Product Data Submittals: For each product.

1. Include construction details, material descriptions, core descriptions, and finishes.

C. Shop Drawings: Include the following:

1. Elevations of each door type.
2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.

4. Locations of reinforcement and preparations for hardware.
5. Details of each different wall opening condition.
6. Details of anchorages, joints, field splices, and connections.
7. Details of accessories.
8. Details of moldings, removable stops, and glazing.

D. Product Schedule: For hollow-metal doors and frames, prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final door hardware schedule.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For door inspector.

1. Egress Door Inspector: Submit documentation of compliance with NFPA 101, Section 7.2.1.15.4.
2. Submit copy of DHI Fire and Egress Door Assembly Inspector (FDAI) certificate.

B. Product Test Reports: For each type of windborne-debris impact resistance door and thermally rated door assemblies for tests performed by a qualified testing agency indicating compliance with performance requirements.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow-metal doors and frames palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.

1. Provide additional protection to prevent damage to factory-finished units.

B. Store hollow-metal doors and frames vertically under cover at Project site with head up. Place on minimum **4-inch-** high wood blocking. Provide minimum **1/4-inch** space between each stacked door to permit air circulation.

PART 2 - PRODUCTS

2.1 HOLLOW METAL DOORS AND FRAMES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Ceco Door; AADG, Inc.; ASSA ABLOY
2. Curries, AADG, Inc.; ASSA ABLOY Group
3. Republic Doors and Frames; a Allegion brand
4. Steelcraft; Allegion plc

2.2 PERFORMANCE REQUIREMENTS

A. Windborne-Debris Impact Resistance: Passes ASTM E1886 missile-impact and cyclic-pressure tests in accordance with ASTM E1996 for Wind Zone 3 for basic protection.

1. Large-Missile Test: For glazed openings located within 30 feet of grade.

B. Thermally Rated Door Assemblies: Provide door assemblies with U-factor of not more than 0.61 deg Btu/F x h x sq. ft. when tested in accordance with ASTM C1363 or ASTM E1423.

2.3 EXTERIOR STANDARD STEEL DOORS AND FRAMES

A. Construct hollow-metal doors and frames to comply with standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Extra-Heavy-Duty Doors and Frames: ANSI/SDI A250.8, Level 3; ANSI/SDI A250.4, Level A. At locations indicated in the Door and Frame Schedule on Drawings.

1. Doors:

a. Type: As indicated in the Door and Frame Schedule on Drawings.
b. Thickness: **1-3/4 inches**.
c. Face: Metallic-coated steel sheet, embossed with 2 panels as shown in Door Legend, minimum thickness of **0.053 inch**, with minimum A60 coating.
d. Edge Construction: Model 3, Stile and Rail.
e. Edge Bevel: Provide manufacturer's standard beveled or square edges.
f. Top Edge Closures: Close top edges of doors with flush closures of same material as face sheets. Seal joints against water penetration.
g. Bottom Edges: Close bottom edges of doors with end closures or channels of same material as face sheets. Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape.
h. Core: Polystyrene Polyurethane Polyisocyanurate.

2. Frames:

a. Materials: Metallic-coated steel sheet, minimum thickness of **0.053 inch**, with minimum A60 coating.
b. Construction: Knocked down.

3. Exposed Finish: Prime.

2.4 FRAME ANCHORS

A. Jamb Anchors:

1. Type: Anchors of minimum size and type required by applicable door and frame

standard, and suitable for performance level indicated.

2. Quantity: Minimum of three anchors per jamb, with one additional anchor for frames with no floor anchor. Provide one additional anchor for each **24 inches** of frame height above **7 feet**.
3. Postinstalled Expansion Anchor: Minimum **3/8-inch-** diameter bolts with expansion shields or inserts, with manufacturer's standard pipe spacer.

B. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor.

C. Floor Anchors for Concrete Slabs with Underlayment: Adjustable-type anchors with extension clips, allowing not less than **2-inch** height adjustment. Terminate bottom of frames at top of underlayment.

D. Material: ASTM A879/A879M, Commercial Steel (CS), **04Z** coating designation; mill phosphatized.

1. For anchors built into exterior walls, steel sheet complying with ASTM A1008/A1008M or ASTM A1011/A1011M; hot-dip galvanized in accordance with ASTM A153/A153M, Class B.

2.5 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

C. Metallic-Coated Steel Sheet: ASTM A653/A653M, Commercial Steel (CS), Type B.

D. Inserts, Bolts, and Fasteners: Hot-dip galvanized in accordance with ASTM A153/A153M.

E. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.

F. Mineral-Fiber Insulation: ASTM C665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E136 for combustion characteristics.

2.6 FABRICATION

A. Hollow-Metal Frames: Fabricate in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of metal of same or greater thickness as frames.

1. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
2. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.

    a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
    b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.

B. Hardware Preparation: Factory prepare hollow-metal doors and frames to receive templated mortised hardware, and electrical wiring; include cutouts, reinforcement, mortising, drilling, and tapping in accordance with ANSI/SDI A250.6, the Door Hardware Schedule on Drawings, and templates.

1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
2. Comply with BHMA A156.115 for preparing hollow-metal doors and frames for hardware.

2.7 STEEL FINISHES

A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.

1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

PART 3 - EXECUTION

3.1 PREPARATION

A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces. Touch up factory-applied finishes where spreaders are removed.

B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.2 INSTALLATION

A. Install hollow-metal doors and frames plumb, rigid, properly aligned, and securely fastened in place. Comply with approved Shop Drawings and with manufacturer's written instructions.

B. Hollow-Metal Frames: Comply with ANSI/SDI A250.11.

1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary

braces without damage to completed Work.

a. Where frames are fabricated in sections, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces. Touch-up finishes.
b. Install frames with removable stops located on secure side of opening.

2. Fire-Rated Openings: Install frames in accordance with NFPA 80.
3. Floor Anchors: Secure with postinstalled expansion anchors.

a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.

4. Solidly pack mineral-fiber insulation inside frames.
5. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout or mortar.
6. Installation Tolerances: Adjust hollow-metal frames to the following tolerances:

a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.

C. Hollow-Metal Doors: Fit and adjust hollow-metal doors accurately in frames, within clearances specified below.

1. Non-Fire-Rated Steel Doors: Comply with ANSI/SDI A250.8.

3.3 FIELD QUALITY CONTROL

A. Inspections:

1. Egress Door Inspections: Inspect each door equipped with panic hardware, each door equipped with fire exit hardware, each door located in an exit enclosure, each electrically controlled egress door, and each door equipped with special locking arrangements in accordance with NFPA 101, Section 7.2.1.15.

B. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.

C. Reinspect repaired or replaced installations to determine if replaced or repaired door assembly installations comply with specified requirements.

3.4 REPAIR

A. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

B. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint in accordance with manufacturer's written instructions.

C. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION 081113

SECTION 081433 - STILE AND RAIL WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior stile and rail wood doors.

B. Related Requirements:

1. Section 099123 "Interior Painting" for field finishing stile and rail doors.

1.2 ACTION SUBMITTALS

A. Product Data:

1. Interior stile and rail wood doors.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each type of door; construction details not covered in Product Data, including those for stiles, rails, panels, and moldings (sticking); and other pertinent data, including the following:

1. Door schedule indicating door and frame location, type, size, fire protection rating, and swing.
2. Door elevations, dimensions and location of hardware, lite locations, and glazing thickness.
3. Details of frame for each frame type, including dimensions and profile.
4. Dimensions and locations of mortises and holes for hardware.
5. Clearances and undercuts.
6. Doors to be factory primed and application requirements.

1.3 INFORMATIONAL SUBMITTALS

A. Sample Warranty: For special warranty.

1.4 CLOSEOUT SUBMITTALS.

A. Special warranties.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of referenced standard and manufacturer's written instructions.

B. Mark each door on top and bottom rail with opening number used on Shop Drawings.

1.6 FIELD CONDITIONS

A. Environmental Limitations:

1. Do not deliver or install doors until building is enclosed and weathertight, wet work is complete and dry, and HVAC system is operating and maintaining temperature between 60 and 90 deg F and relative humidity between 43 and 70 percent during remainder of construction period.

1.7 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace doors and frames that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Delamination of veneer.
b. Warping (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section.
c. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span.

2. Warranty must also include installation and finishing that may be required due to repair or replacement of defective doors and frames.
3. Warranty must be in effect during specified period of time from date of Substantial Completion.
4. Warranty Period for Interior Doors: Life of installation.
5. Insulating Glass Vision Panels: Five years.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain stile and rail wood doors from single manufacturer.

2.2 MATERIALS

A. Use only materials that comply with referenced standards and other requirements specified.

1. Assemble interior doors, including components, with either dry-use or wet-use

adhesives complying with ASTM D5572 for finger joints and with ASTM D5751 for joints other than finger joints.

B. Panel Products: Any of the following unless otherwise indicated:

1. Particleboard: ANSI A208.1, Grade M-2.
2. Medium-density fiberboard (MDF), complying with ANSI A208.2, Grade 130.
3. Hardboard complying with ANSI A135.4.
4. Veneer-core plywood.

C. Safety Glass: Provide products complying with testing requirements in 16 CFR 1201, for Category II materials, unless those of Category I are expressly indicated and permitted.

2.3 INTERIOR STILE AND RAIL WOOD DOORS

A. Interior Stile and Rail Wood Doors: Interior stock doors complying with AWI, AWMAC, and WI's Architectural Woodwork Standards and with other requirements specified.

1. Basis-of-Design Product: Subject to compliance with requirements, provide TruStile, a Marvin Brand; TS Series or comparable product by one of the following:

a. ETO Doors Corp.
b. Forte Opening Solutions
c. Karona by JELD-WEN
d. VT Industries, Inc.

2. Performance Grade: ANSI/WDMA I.S. 1A Standard Duty.
3. ANSI/WDMA I.S. 1A Quality Grade: Custom.
4. Panel Designs: Indicated on Drawings. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
5. Finish: Opaque.
6. Door Construction for Opaque Finish:

a. Stile and Rail Construction:

1) Veneered, structural composite lumber or veneered edge- and end-glued lumber.

b. Flat-Panel Construction: Medium-density fiberboard.

7. Stile and Rail Widths: Manufacturer's standard, but not less than the following:

a. Stiles, Top and Intermediate Rails: 4-1/2 inches.
b. Bottom Rails: 9 inches.

8. Flat-Panel Thickness: 3/8 inch.
9. Molding Profile (Sticking): As selected by Architect from manufacturer's full range.

10. Glass: Uncoated, clear, fully tempered float glass, 5.0 mm thick, complying with Section 088000 "Glazing."

2.4 STILE AND RAIL WOOD DOOR FABRICATION

A. Factory fit doors to suit frame-opening sizes indicated, with the following uniform clearances and bevels unless otherwise indicated:

1. Clearances:

a. Provide 1/8 inch at heads, jambs, and between pairs of doors.
b. Provide 1/2 inch from bottom of door to top of decorative floor finish or covering.
c. Where threshold is shown on Drawings or scheduled, provide not more than 3/8 inch from bottom of door to top of threshold.

2. Bevel non-fire-rated doors **1/8 inch in 2 inches** at lock and hinge edges.

B. Factory machine doors for hardware that is not surface applied.

1. Locate hardware to comply with DHI-WDHS-3.
2. Comply with final hardware schedules, door frame Shop Drawings, BHMA-156.115-W, and hardware templates.
3. Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before factory machining.

C. Glazed Openings:

1. Factory install glazing in doors, complying with Section 088000 "Glazing." Install glass using manufacturer's standard elastomeric glazing sealant complying with ASTM C920. Secure glass in place with removable wood moldings. Miter wood moldings at corner joints.

2.5 FACTORY PRIMING

A. Doors for Opaque Finish: Shop prime faces, all four edges, edges of cutouts, and mortises with one coat of wood primer specified in Section 099123 "Interior Painting."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and installed door frames, with Installer present, before hanging doors.

1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
2. Reject doors with defects.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Hardware: For installation, see Section 087100 "Door Hardware."

B. Install doors and frames to comply with manufacturer's written instructions and referenced quality standard, and as indicated.

C. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

3.3 FIELD QUALITY CONTROL

A. Inspections:

1. Provide inspection of installed Work through AWI's Quality Certification Program, certifying that woodwork, including installation, complies with requirements of the Architectural Woodwork Standards for the specified grade.
2. Egress Door Inspections: Inspect each door equipped with panic hardware, each door equipped with fire exit hardware, each door located in an exit enclosure, each electrically controlled egress door, and each door equipped with special locking arrangements in accordance with NFPA 101, Section 7.2.1.15.

B. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.

C. Reinspect repaired or replaced installations to determine if replaced or repaired door installations comply with specified requirements.

3.4 ADJUSTING

A. Operation: Rehang or replace doors that do not swing or operate freely.

B. Finished Doors: Replace doors that are damaged or do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 081433

SECTION 081433.13 - WOOD TERRACE DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Vinyl-clad hinged wood-framed glass doors.

B. Related Requirements:

1. Section 085200 "Wood Windows" for transom and sidelite windows, mullions, and coordinating finishes among fenestration units.
2. Section 087100 "Door Hardware" for hardware not specified in this Section.
3. Section 099123 "Interior Painting" for field finishing of factory-primed hinged wood-framed glass doors.
4. Section 099300 "Staining and Transparent Finishing" for field finishing of unfinished hinged wood-framed glass doors.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Review, discuss, and coordinate the interrelationship of hinged wood-framed glass doors with other exterior wall components. Include provisions for anchoring, flashing, weeping, sealing perimeters, and protecting finishes.
3. Review and discuss the sequence of work required to construct a watertight and weathertight exterior building envelope.
4. Inspect and discuss the condition of substrate and other preparatory work performed by other trades.

1.3 ACTION SUBMITTALS

A. Product Data:

1. For each type of hinged wood-framed glass door.

a. Include construction details, material descriptions, fabrication methods, dimensions of individual components and profiles, hardware, and finishes.

B. Shop Drawings:

1. Plans, elevations, sections, hardware, accessories, and details of installation, including anchor, flashing, and sealant installation.

C. Samples for Initial Selection: Manufacturer's standard color sheets, showing full range of available colors for each type of exposed finish.

D. Samples for Verification: Actual sample of finished products for each type of exposed finish.

1. Main Framing Member: 4-inch-long section with specified finishes.
2. Exposed Hardware: Full-size units with factory-applied finish.

E. Product Schedule: For hinged wood-framed glass doors. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For each configuration of hinged wood-framed glass door, for tests performed by manufacturer and witnessed by a qualified testing agency.

B. Sample Warranties: For hinged wood-framed glass doors.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For factory-applied finishes, weather stripping, operable leaves, and operating hardware.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: A manufacturer capable of fabricating hinged wood-framed glass doors that meet or exceed performance requirements indicated and of documenting this performance by test reports and calculations.

B. Installer Qualifications: Entity acceptable to hinged wood-framed glass door manufacturer for installation of units required for this Project.

1.7 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of hinged wood-framed glass doors that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures, including excessive deflection, water penetration, and air leakage.
b. Faulty operation of doors and hardware.
c. Deterioration of materials and factory-applied finishes beyond normal

weathering.

d. Failure of insulating glass and laminated glass.

2. Warranty Period:

a. Hinged Wood-Framed Glass Doors: 20 years from date of Substantial Completion.
b. Insulating Glass: 20 years from date of Substantial Completion.
c. Laminated Glass: Five years from date of Substantial Completion.
d. Exterior Factory-Applied Finishes: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain hinged wood-framed glass doors from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Product Standard: Comply with AAMA/WDMA/CSA 101/I.S.2/A440 for minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.

1. Product Certification: WDMA certified with label attached to each door.

B. Performance Class and Grade: AAMA/WDMA/CSA 101/I.S.2/A440 as follows:

1. Minimum Performance Class: Class CW.
2. Minimum Performance Grade: Grade 40.

C. Thermal Transmittance: NFRC 100 maximum whole-unit U-factor of 0.83 Btu/sq. ft. x h x deg F.

D. Solar Heat-Gain Coefficient (SHGC): NFRC 200 whole-unit maximum SHGC of 0.30.

E. Outside-Inside Transmission Class (OITC): Rated for not less than 26 OITC when tested for laboratory sound transmission loss in accordance with ASTM E90 and determined by ASTM E1332.

F. Windborne-Debris Impact Resistance: Passes ASTM E1886 missile-impact and cyclic-pressure tests in accordance with requirements in ASTM E1996 for Wind Zone 3 for basic protection.

1. Large-Missile Test: For glazing located within 30 ft. of grade.

2.3 VINYL-CLAD HINGED WOOD-FRAMED GLASS DOORS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Andersen Windows, Inc.; Andersen Corporation
2. Kolbe Windows and Doors
3. Marvin Windows and Doors

B. Exterior Surfaces: Vinyl-clad frames; vinyl-clad or high-performance color-coated finish on glazed leaves.

1. Color: As selected by Architect from manufacturer's full range.

C. Interior Surfaces: Maple.

1. Visible Finger Joints: Not allowed.
2. Finish: Unfinished.

2.4 DOOR-ASSEMBLY COMPONENTS

A. Wood Components: LVL or fine-grained wood lumber complying with AAMA/WDMA/CSA 101/I.S.2/A440; kiln dried to maximum moisture content of 12 percent at time of fabrication; water-repellent preservative treated.

B. Trim and Glazing Stops: Material and finish to match adjacent door components.

C. Sidelites: Provide manufacturer's fixed sidelites from same product line as doors; fabricated and finished to match door frames and leaves; in configuration indicated on Drawings.

D. Mullions: Provide mullions and mullion casing and cover plates as indicated on Drawings, matching door frames and leaves, complete with anchors for support to structure and installation of hinged wood-framed glass door assemblies. Allow for erection tolerances and provide for movement of door assemblies from thermal expansion and building deflections. Provide mullions and cover plates capable of withstanding design loads of door assemblies.

E. Integral Nailing Fin: Manufacturer's standard nailing fin for securing frame to structure; with sufficient strength to withstand design pressure indicated.

F. Drip Caps: Manufacturer's standard; factory fabricated and finished to match exterior door frame; designed to direct water away from building when installed horizontally at head of hinged wood-framed glass doors.

G. Thresholds: low-profile; of dimensions and profile indicated on Drawings; designed to comply with performance requirements indicated and to drain to exterior.

1. Color: Bronze.
2. Low-Profile Thresholds: Comply with requirements in the DOJ's "2010 ADA Standards for Accessible Design".

a. Provide low-profile threshold where indicated in schedules.

2.5 GLAZING

A. Glass and Glazing: Manufacturer's standard glazing system that produces weathertight seal. Comply with requirements for windborne-debris impact resistance.

1. Glass: ASTM C1036, Type 1, q3, Category II safety glass complying with testing requirements in 16 CFR 1201.
2. Safety Glazing Labeling: Permanently mark safety glazing with manufacturer's certification label indicating manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
3. Tint: Bronze.

a. Filling: Fill space between glass lites with [**air**][**argon**].
b. Lites: [**Two**][**Three**]<**Insert requirements**>.
c. Low-E Coating: [**As required to meet performance requirements**][**Pyrolytic on second surface**][**Sputtered on second surface**][**Sputtered on third surface**][**Sputtered on second or third surface**]<**Insert requirements**>.
d. Spacer Color: [**Manufacturer's standard**][**Silver**][**Gray**][**Black**]<**Inset color**>.

4. Dual Glazing:

a. Exterior Glazing: Insulating-glass unit.

B. Simulated Divided Lites: Provide grilles in configuration indicated on Drawings and as follows:

1. Grilles between Lites: Provide grilles permanently installed between lites of insulating-glass units in color selected by Architect from manufacturer's full range.
2. Profile: Manufacturer's standard contoured profile.
3. Width: 5/8 inch.

2.6 HARDWARE

A. General: Manufacturer's standard hardware complying with requirements in AAMA 907; fabricated from corrosion-resistant material compatible with materials with which it comes in contact; designed to smoothly operate, tightly close, and securely lock hinged wood-framed glass doors; and sized to accommodate door-leaf weight and dimensions.

1. Color and Finish: As selected by Architect from manufacturer's full range.

B. Operating Hardware:

1. Design: As selected from manufacturer's full range.

C. Lock:

1. Type: Manufacturer's standard multipoint locking device on each operable leaf.
2. Active-Leaf Lock Operation: Thumb turn inside, keyed outside.

a. Keying System: Keyed to match other building entrances.

2.7 ACCESSORIES

A. Fasteners: Noncorrosive and compatible with door members, trim, hardware, anchors, and other components.

1. Exposed Fasteners: Do not use exposed fasteners to greatest extent possible. For application of hardware, use fasteners that match finish hardware being fastened.

B. Anchors, Clips, and Accessories: Provide anchors, clips, and accessories of aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron for hinged wood-framed glass doors, complying with ASTM B456 or ASTM B633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.

1. Windborne-Debris Impact Resistance: Provide anchors of same design used in windborne-debris impact-resistance testing.

2.8 FABRICATION

A. Fabricate hinged wood-framed glass doors in sizes and with stile and rail dimensions indicated on Drawings. Include a complete system for assembling components and anchoring doors.

B. Fabricate components that are reglazable without dismantling door or frame.

C. Weather Stripping: Provide full-perimeter weather stripping for each door.

D. Factory machine hinged wood-framed glass doors for openings and hardware that is not surface applied.

E. Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation. Allow for scribing, trimming, and fitting at Project site.

F. Factory-Glazed Fabrication: Glaze hinged wood-framed glass doors in the factory.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Verify rough opening dimensions, levelness of substrate, and operational clearances.

C. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure a coordinated, weathertight hinged door installation.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF HINGED WOOD-FRAMED GLASS DOORS

A. Comply with Drawings, Shop Drawings, and manufacturer's written instructions for installing doors, hardware, accessories, and other components.

B. Windborne-Debris Impact Resistance: Anchor hinged wood-framed glass doors that have been tested for windborne-debris impact resistance to structure using anchoring method, fastener type, and fastening frequency identical to that used in windborne-debris impact-resistance testing.

C. Install hinged wood-framed glass doors level, plumb, square, true in line; without distortion, warp, or rack of frames and leaves, and without impeding thermal movement; anchored securely in place to structural support; and in proper relation to wall flashing, vapor retarders, air barriers, water/weather barriers, and other adjacent construction. Comply with requirements in ASTM E2112.

D. Set threshold members in bed of sealant, as indicated on Drawings, to provide weathertight construction.

3.3 ADJUSTING, CLEANING, AND PROTECTION

A. Lubricate hardware and moving parts in accordance with manufacturer's written instructions.

B. Adjust doors to provide a tight fit at contact points and weather stripping for smooth operation, without binding, and weathertight closure.

C. Adjust hardware for proper alignment, smooth operation, and proper latching and locking without unnecessary force or having excessive clearance.

D. Clean exposed surfaces immediately after installing hinged wood-framed glass doors. Avoid damaging protective coatings and finishes. Remove nonpermanent labels, excess sealants, excess glazing materials, dirt, and other foreign substances.

E. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

F. Protect hinged wood-framed glass door surfaces from contact with contaminating substances resulting from construction operations. If contaminating substances contact hinged wood-framed glass door surfaces, remove contaminants immediately in accordance with manufacturer's written instructions.

G. Refinish or replace hinged wood-framed glass doors with damaged factory-applied finishes.

H. Replace damaged components.

END OF SECTION 081433.13

SECTION 083313 - COILING COUNTER DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Counter door assemblies.

1.2 ACTION SUBMITTALS

A. Product Data: For each type and size of coiling counter door and accessory.

1. Include construction details, material descriptions, dimensions of individual components, profiles for slats, and finishes.

B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data.

1. Include plans, elevations, sections, and mounting details.
2. Include details of equipment assemblies, and indicate dimensions, required clearances, method of field assembly, components, and location and size of each field connection.
3. Include points of attachment and their corresponding static and dynamic loads imposed on structure.
4. Show locations of controls, locking devices , detectors or replaceable fusible links, and other accessories.

C. Samples for Initial Selection: Manufacturer's finish charts showing full range of colors and textures available for units with factory-applied finishes.

1. Include similar Samples of accessories involving color selection.

D. Samples for Verification: For each type of exposed finish on the following components, in manufacturer's standard sizes:

1. Curtain slats .
2. Bottom bar .
3. Guides.
4. Brackets.
5. Hood.
6. Locking device(s).
7. Include similar Samples of accessories involving color selection.

1.3 CLOSEOUT SUBMITTALS

A. Maintenance Data: For coiling counter doors to include in maintenance manuals.

PART 2 - PRODUCTS

A. Obtain coiling counter doors from single source from single manufacturer.

2.2 COUNTER DOOR ASSEMBLY

A. Counter Door: Coiling counter door formed with curtain of interlocking metal slats.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. ACME Rolling Doors
b. ASTA America; Janus International Group
c. Clopay Building Products
d. McKeon Door Company
e. Metro Door LLC
f. Overhead Door Corporation
g. Wayne Dalton; a division of Overhead Door Corporation

B. Operation Cycles: Door components and operators capable of operating for not less than 20,000. One operation cycle is complete when a door is opened from the closed position to the fully open position and returned to the closed position.

1. Include tamperproof cycle counter.

C. Door Curtain Material: Galvanized steel.

D. Door Curtain Slats: Flat profile slats of between 1-inch and 2-inches center-to-center height.

E. Bottom Bar: Manufacturer's standard continuous channel or tubular shape, fabricated hot-dip galvanized steel and finished to match door.

F. Curtain Jamb Guides: Galvanized steel with exposed finish matching curtain slats. Provide continuous integral wear strips to prevent metal-to-metal contact and to minimize operational noise.

G. Hood: Match curtain material and finish.

1. Shape: Round.
2. Mounting: Face of wall.

H. Sill Configuration: No sill.

I. Locking Devices: Equip door with locking device assembly.

1. Locking Device Assembly: Cremone-type, both jamb sides locking bars, operable from inside with thumbturn outside with cylinder.

J. Manual Door Operator: Push-up operation.

K. Curtain Accessories: Equip door with push/pull handles.

L. Door Finish:

1. Baked-Enamel or Powder-Coated Finish: Color as selected by Architect from manufacturer's full range.

M. Door Curtains: Fabricate coiling counter door curtain of interlocking metal slats in a continuous length for width of door without splices. Unless otherwise indicated, provide slats of thickness and mechanical properties recommended by door manufacturer for performance, size, and type of door indicated, and as follows:

1. Steel Door Curtain Slats: Zinc-coated (galvanized), cold-rolled structural-steel sheet; complying with ASTM A653/A653M, with G90 zinc coating; nominal sheet thickness (coated) of 0.028 inch; and as required.

N. Curtain Jamb Guides: Manufacturer's standard angles or channels and angles of same material and finish as curtain slats unless otherwise indicated, with sufficient depth and strength to retain curtain, to allow curtain to operate smoothly, and to withstand loading. Slot bolt holes for guide adjustment. Provide removable stops on guides to prevent overtravel of curtain.

2.3 HOODS

A. General: Form sheet metal hood to entirely enclose coiled curtain and operating mechanism at opening head. Contour to fit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Form closed ends for surface-mounted hoods and fascia for any portion of between-jamb mounting that projects beyond wall face. Equip hood with intermediate support brackets as required to prevent sagging.

1. Galvanized Steel: Nominal 0.028-inch- thick, hot-dip galvanized-steel sheet with G90 zinc coating, complying with ASTM A653/A653M.

2.4 LOCKING DEVICES

A. Slide Bolt: Fabricate with side-locking bolts to engage through slots in tracks for locking by padlock, located on both left and right jamb sides, operable from coil side.

B. Locking Device Assembly: Fabricate with cylinder lock, spring-loaded dead bolt, operating handle, cam plate, and adjustable locking bars to engage through slots in tracks.

1. Lock Cylinders: As specified in Section 087111 "Door Hardware (Descriptive

Specification)" and keyed to building keying system.

2.5 CURTAIN ACCESSORIES

A. Astragal: Equip each door bottom bar with a replaceable, adjustable, continuous, compressible gasket of flexible vinyl, rubber, or neoprene as a cushion bumper.

B. Push/Pull Handles: Equip each push-up-operated or emergency-operated door with lifting handles on each side of door, finished to match door.

2.6 COUNTERBALANCE MECHANISM

A. General: Counterbalance doors by means of manufacturer's standard mechanism with an adjustable-tension, steel helical torsion spring mounted around a steel shaft and contained in a spring barrel connected to top of curtain with barrel rings. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.

B. Counterbalance Barrel: Fabricate spring barrel of manufacturer's standard hot-formed, structural-quality, seamless or welded carbon-steel pipe, of sufficient diameter and wall thickness to support rolled-up curtain without distortion of slats and to limit barrel deflection to not more than 0.03 in./ft. of span under full load.

C. Counterbalance Spring: One or more oil-tempered, heat-treated steel helical torsion springs. Size springs to counterbalance weight of curtain, with uniform adjustment accessible from outside barrel. Secure ends of springs to barrel and shaft with cast-steel barrel plugs.

1. Fire-Rated Doors: Equip with auxiliary counterbalance spring and prevent tension release from main counterbalance spring when automatic closing device operates.

D. Torsion Rod for Counterbalance Shaft: Fabricate of manufacturer's standard cold-rolled steel, sized to hold fixed spring ends and carry torsional load.

E. Brackets: Manufacturer's standard mounting brackets of either cast iron or cold-rolled steel plate.

2.7 MANUAL DOOR OPERATORS

A. General: Equip door with manual door operator by door manufacturer.

B. Push-up Door Operation: Design counterbalance mechanism so that required lift or pull for door operation does not exceed 25 lbf.

2.8 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM/NOMMA 500 for recommendations for applying and designating finishes.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.9 STEEL AND GALVANIZED-STEEL FINISHES

A. Baked-Enamel or Powder-Coat Finish: Manufacturer's standard baked-on finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for cleaning, pretreatment, application, and minimum dry film thickness.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates areas and conditions, with Installer present, for compliance with requirements for substrate construction and other conditions affecting performance of the Work.

B. Examine locations of electrical connections.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Install coiling counter doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to manufacturer's written instructions and as specified.

B. Install coiling counter doors, hoods, controls, and operators at the mounting locations indicated for each door.

3.3 FIELD QUALITY CONTROL

A. Perform the following tests and inspections :

1. Test door release, closing, and alarm operations when activated by smoke detector or building's fire-alarm system. Test manual operation of closed door. Reset door-closing mechanism after successful test.

B. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.

C. Reinspect repaired or replaced installations to determine if replaced or repaired door assembly installations comply with specified requirements.

3.4 ADJUSTING

A. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion.

B. Lubricate bearings and sliding parts as recommended by manufacturer.

C. Adjust seals to provide tight fit around entire perimeter.

3.5 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain coiling counter doors.

END OF SECTION 083313

SECTION 085423 - FIBERGLASS COMPOSITE WINDOWS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fiberglass-composite-framed windows.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Review, discuss, and coordinate the interrelationship of fiberglass-composite windows with other exterior wall components. Include provisions for anchoring, flashing, weeping, sealing perimeters, and protecting finishes.
3. Review and discuss the sequence of work required to construct a watertight and weathertight exterior building envelope.
4. Inspect and discuss the condition of substrate and other preparatory work performed by other trades.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, glazing and fabrication methods, dimensions of individual components and profiles, hardware, and finishes for fiberglass-composite windows.

B. Shop Drawings: For fiberglass-composite windows.

1. Include plans, elevations, sections, hardware, accessories, insect screens, operational clearances, and details of installation, including anchor, flashing, and sealant installation.

C. Samples: For each exposed product and for each color specified, 2 by 4 inches in size.

D. Samples for Initial Selection: For units with factory-applied finishes.

1. Include Samples of hardware and accessories involving color selection.

E. Samples for Verification: For fiberglass-composite windows and components required, prepared on Samples of size indicated below:

1. Exposed Finishes: 2 by 4 inches.
2. Exposed Hardware: Full-size units.

F. Product Schedule: For fiberglass-composite windows. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer and Installer.

B. Product Test Reports: For each type of fiberglass-composite window, for tests performed by a qualified testing agency.

C. Field quality-control reports.

D. Sample Warranties: For manufacturer's warranties.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: A manufacturer capable of fabricating fiberglass-composite windows that meet or exceed performance requirements indicated and of documenting this performance by test reports and calculations.
2. Installer: An installer acceptable to fiberglass-composite window manufacturer for installation of units required for this Project.

B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.

1. Build mockup of typical wall area as indicated on Drawings.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace fiberglass-composite windows that fail in materials or workmanship within specified warranty period.

1. Warranty Period:

a. Window: **10** years from date of Substantial Completion.
b. Glazing Units: **20** years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain fiberglass-composite windows from single source from single manufacturer.

2.2 WINDOW PERFORMANCE REQUIREMENTS

A. Product Standard: Comply with AAMA/WDMA/CSA 101/I.S.2/A440 for definitions and minimum standards of performance, materials, components, accessories, and fabrication unless more-stringent requirements are indicated.

1. Window Certification: WDMA certified with label attached to each window.

B. Performance Class and Grade: AAMA/WDMA/CSA 101/I.S.2/A440 as follows:

1. Minimum Performance Class: **CW**.
2. Minimum Performance Grade: **50**.

C. Thermal Transmittance: NFRC 100 maximum whole-window U-factor of 0.65 Btu/sq. ft. x h x deg F for operable windows and 0.50 Btu/sq. ft. x h x deg F for fixed windows.

D. Solar Heat-Gain Coefficient (SHGC): NFRC 200 maximum whole-window SHGC of 0.25.

E. Sound Transmission Class (STC): Rated for not less than **26** STC when tested for laboratory sound transmission loss in accordance with ASTM E90 and determined by ASTM E413.

F. Outside-Inside Transmission Class (OITC): Rated for not less than **22** OITC when tested for laboratory sound transmission loss in accordance with ASTM E90 and determined by ASTM E1332.

G. Windborne-Debris Impact Resistance: Passes ASTM E1886 missile-impact and cyclic-pressure tests in accordance with ASTM E1996 for Wind Zone **3 (Ultimate Wind Speed of 153 Vmph)** for **basic** protection.

1. Large-Missile Test: For glazing located within 30 ft. of grade

2. Small-Missile Test: For glazing locating above 30 ft. from grade.

2.3 FIBERGLASS-COMPOSITE WINDOWS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Kolbe Windows & Doors; Forgent Series or comparable product by one of the following:

1. Marvin Windows and Doors.
2. Milgard Manufacturing, Inc.
3. Pella Corporation.

B. Operating Types: Provide the following operating types in locations indicated on Drawings:
   1. Double hung.
   2. Fixed.

C. Exterior Surfaces: Fiberglass-composite consisting of fiberglass and UV-stable polymer complying with AAMA/WDMA/CSA 101/I.S.2/A440 and finished with manufacturer's standard **integral color**.

   1. Exterior Color: to be selected from Manufacturer’s full range.

D. Interior Surfaces: Fiberglass composite consisting of fiberglass and UV-stable polymer complying with AAMA/WDMA/CSA 101/I.S.2/A440 and finished with manufacturer's standard **integral color**.

   1. Exterior Color: Interior Color: to be selected by Architect from Manufacturer’s full range.

E. Windborne-Debris-Impact-Resistant Insulating-Glass Units: ASTM E2190 with one or two lites and complying with impact-resistance requirements in "Window Performance Requirements" Article.

   1. Interior Lite: ASTM C1036, Type 1, Class 1, q3.

      a. Tint: **Bronze**.
      b. Kind: **Fully tempered**.

   2. Exterior Lite: ASTM C1172 clear laminated glass with two plies of float glass.

      a. Float Glass: **As required by performance requirements indicated**.
      b. Interlayer Thickness: **As required by performance requirements indicated**.

   3. Filling: Fill space between glass lites with **argon**.
   4. Low-E Coating: As required by performance requirements indicated.

F. Glazing System: **Manufacturer's standard factory-glazing system that produces weathertight seal**.

G. Hardware, General: Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, carbon steel complying with AAMA 907, or other corrosion-resistant material compatible with adjacent materials; designed to smoothly operate, tightly close, and securely lock fiberglass-composite windows, and sized to accommodate sash weight and dimensions.

   1. Exposed Hardware Color and Finish: As selected by Architect from Manufacturer’s full range.

H. Projected Window Hardware:

1. Gear-Type Rotary Operators: Complying with AAMA 901 when tested in accordance with ASTM E405, Method A. Provide operators that function without requiring the removal of interior screens or using screen wickets.

    a. Type and Style: **As selected by Architect from manufacturer's full range of types and styles**.

2. Hinges: **Stainless steel hinges with stainless steel-reinforced, sliding nylon shoes**.
3. Single-Handle Multi-Point Locking System: Operates positive-acting arms that pull sash into locked position. Provide one arm on sashes up to 27-1/2 inches tall and two arms on taller sashes.
4. Limit Devices: **Concealed support arms with adjustable, limited, hold-open** limit devices designed to restrict sash opening.
5. Pole Operators: Tubular-shaped anodized aluminum; with rubber-capped lower end and standard push-pull hook at top to match hardware design; of sufficient length to operate window without reaching more than 60 inches above floor; one pole operator and pole hanger per room that has operable windows more than 72 inches above floor.

I. Hung Window Hardware:

1. Counterbalancing Mechanism: Complying with AAMA 902, concealed, of size and capacity to hold sash stationary at any open position.
2. Locks and Latches: Allow unobstructed movement of the sash across adjacent sash in direction indicated and operated from the inside only.
3. Tilt Hardware: Releasing tilt latch allows sash to pivot about horizontal axis to facilitate cleaning exterior surfaces from the interior.

J. Integral Nailing Fin: Manufacturer's standard integral nailing fin for securing frame to structure during installation to hold unit plumb, square, and true.

K. Installation Clips: Provide manufacturer's standard clips of sufficient strength to withstand design pressure indicated.

L. Weather Stripping: Provide full-perimeter weather stripping for each operable sash unless otherwise indicated.

M. Fasteners: Noncorrosive and compatible with window members, trim, hardware, anchors, and other components.

1. Exposed Fasteners: Do not use exposed fasteners to greatest extent possible. For application of hardware, use fasteners that match finish hardware being fastened.

2.4 INSECT SCREENS

A. General: Fabricate insect screens to integrate with window frame. Provide screen for each operable exterior sash. Screen wickets are not permitted.

1. Type and Location: **Full, outside for double-hung** sashes.

B. Aluminum Frames: Manufacturer's standard aluminum alloy complying with SMA 1004 or SMA 1201. Fabricate frames with mitered or coped joints or corner extrusions, concealed fasteners, and removable PVC spline/anchor concealing edge of frame.

1. Tubular Framing Sections and Cross Braces: Roll formed from aluminum sheet.
2. Finish for Exterior Screens: **Baked-on organic coating in color selected by Architect from manufacturer's full range**.

C. Aluminum Wire Fabric: 18-by-16 (1.1-by-1.3-mm) mesh of 0.011-inch- (0.28-mm-) diameter, coated aluminum wire.

1. Wire-Fabric Finish: Charcoal.

2.5 FABRICATION

A. Fabricate fiberglass-composite windows in sizes indicated. Include a complete system for installing and anchoring windows.

B. Glaze fiberglass-composite windows in the factory.

C. Weather strip each operable sash to provide weathertight installation.

D. Mullions: Provide mullions and cover plates, matching window units, complete with anchors for support to structure and installation of window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections. Provide mullions and cover plates capable of withstanding design wind loads of window units.

E. Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation. Allow for scribing, trimming, and fitting at Project site.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Verify rough opening dimensions, levelness of sill plate, and operational clearances.

C. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure weathertight window installation.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with manufacturer's written instructions for installing windows, hardware, accessories, and other components. For installation procedures and requirements not addressed in manufacturer's written instructions, comply with installation requirements in ASTM E2112.

B. Install windows level, plumb, square, true to line, without distortion, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction to produce weathertight construction.

C. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action (dissimilar materials, treated lumber, etc.) at points of contact with other materials.

D. For fin method of attachment, integrate window system installation with exterior water-resistant barrier using flashing/sealant tape. Apply and integrate flashing/sealant tape with water-resistant barrier using watershed principles in accordance with window manufacturer's written instructions.

E. Place interior seal around window perimeter to maintain continuity of building thermal and air barrier using insulating-foam sealant.

F. Seal window to exterior wall cladding with sealant and related backing materials at perimeter of assembly.

G. Leave windows closed and locked.

3.3 FIELD QUALITY CONTROL

A. Testing Agency: **Owner will engage** a qualified testing agency to perform tests and inspections.

1. Testing and inspecting agency will interpret tests and state in each report whether tested work complies with or deviates from requirements.

B. Testing Services: Testing and inspecting of installed windows are to take place as follows:

1. Testing Methodology: Testing of windows for air infiltration and water resistance is to be performed in accordance with AAMA 502.
2. Air-Infiltration Testing:

    a. Test Pressure: That required to determine compliance with AAMA/WDMA/CSA 101/I.S.2/A440 performance class indicated.
    b. Allowable Air-Leakage Rate: **1.5** times the applicable AAMA/WDMA/CSA 101/I.S.2/A440 rate for product type and performance class rounded down to one decimal place.

3. Water-Resistance Testing:

a. Test Pressure: **Two-thirds** times test pressure required to determine compliance with AAMA/WDMA/CSA 101/I.S.2/A440 performance grade indicated.
b. Allowable Water Infiltration: No water penetration.

4. Testing Extent: **Three** windows of each type as selected by Architect and a qualified independent testing and inspecting agency. Windows are to be tested after perimeter sealants have cured.
5. Test Reports: Prepared in accordance with AAMA 502.

C. Windows will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports.

3.4 ADJUSTING, CLEANING, AND PROTECTION

A. Adjust operating sashes and hardware for a tight fit at contact points and weather stripping for smooth operation and weathertight closure.

B. Clean exposed surfaces immediately after installing windows. Remove excess sealants, glazing materials, dirt, and other substances.

1. Keep protective films and coverings in place until final cleaning.

C. Remove and replace sashes if glass has been broken, chipped, cracked, abraded, or damaged during construction period.

D. Protect window surfaces from contact with contaminating substances resulting from construction operations. If contaminating substances do contact window surfaces, remove contaminants immediately in accordance with manufacturer's written instructions.

END OF SECTION 085423

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior gypsum board.
2. Tile backing panels.

B. Related Requirements:

1. Section 093013 "Ceramic Tiling" for cementitious backer units installed as substrates for ceramic tile.

1.2 ACTION SUBMITTALS

A. Product Data: For the following:

1. Gypsum wallboard.
2. Gypsum board, Type X.
3. Gypsum ceiling board.
4. Mold-resistant gypsum board.
5. Cementitious backer units.
6. Aluminum trim.

1.3 DELIVERY, STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.4 FIELD CONDITIONS

A. Environmental Limitations: Comply with ASTM C840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.

B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E119 by an independent testing agency.

2.2 GYPSUM BOARD, GENERAL

A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

A. Gypsum Wallboard: ASTM C1396/C1396M.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. American Gypsum
b. CertainTeed; SAINT-GOBAIN
c. Georgia-Pacific Gypsum LLC
d. Gold Bond Building Products, LLC provided by National Gypsum Company
e. PABCO Gypsum
f. USG Corporation

2. Thickness: 1/2 inch.
3. Long Edges: Tapered.

2.4 TILE BACKING PANELS

2.5 TRIM ACCESSORIES

A. Interior Trim: ASTM C1047.

1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc.
2. Shapes:

a. Cornerbead.
b. Bullnose bead.
c. LC-Bead: J-shaped; exposed long flange receives joint compound.
d. L-Bead: L-shaped; exposed long flange receives joint compound.

e. U-Bead: J-shaped; exposed short flange does not receive joint compound.
f. Expansion (control) joint.
g. Curved-Edge Cornerbead: With notched or flexible flanges.

B. Exterior Trim: ASTM C1047.

1. Material: Hot-dip galvanized-steel sheet, plastic, or rolled zinc.
2. Shapes:

a. Cornerbead.
b. LC-Bead: J-shaped; exposed long flange receives joint compound.
c. Expansion (Control) Joint: One-piece, rolled zinc with V-shaped slot and removable strip covering slot opening.

2.6 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C475/C475M.

B. Joint Tape:

1. Interior Gypsum Board: Paper.
2. Tile Backing Panels: As recommended by panel manufacturer.

C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.

1. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.

a. Use setting-type compound for installing paper-faced metal trim accessories.

3. Fill Coat: For second coat, use setting-type, sandable topping compound.
4. Finish Coat: For third coat, use drying-type, all-purpose compound.

D. Joint Compound for Tile Backing Panels:

1. Glass-Mat, Water-Resistant Backing Panel: As recommended by backing panel manufacturer.
2. Cementitious Backer Units: As recommended by backer unit manufacturer.
3. Water-Resistant Gypsum Backing Board: Use setting-type taping compound and setting-type, sandable topping compound.

2.7 AUXILIARY MATERIALS

A. Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.

B. Steel Drill Screws: ASTM C1002 unless otherwise indicated.

1. Use screws complying with ASTM C954 for fastening panels to steel members from **0.033 to 0.112 inch** thick.
2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

C. Sound-Attenuation Blankets: ASTM C665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.

1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

D. Acoustical Sealant: As specified in Section 079219 "Acoustical Joint Sealants."

E. Thermal Insulation: As specified in Section 072100 "Thermal Insulation."

F. Vapor Retarder: As specified in Section 072600 "Vapor Retarders."

2.8 TEXTURE FINISHES

A. Primer: As recommended by textured finish manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION AND FINISHING OF PANELS, GENERAL

A. Comply with ASTM C840.

B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than **1/16 inch** of open space between panels. Do not force into place.

D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

E. Form control and expansion joints with space between edges of adjoining gypsum panels.

F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.

1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than **8 sq. ft.** in area.
2. Fit gypsum panels around ducts, pipes, and conduits.
3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow **1/4- to 3/8-inch-** wide joints to install sealant.

G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide **1/4- to 1/2-inch-** wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

I. Wood Framing: Install gypsum panels over wood framing, with floating internal corner construction. Do not attach gypsum panels across the flat grain of wide-dimension lumber, including floor joists and headers. Float gypsum panels over these members or provide control joints to counteract wood shrinkage.

J. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C919 and with manufacturer's written instructions for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.

K. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

3.3 INSTALLATION OF INTERIOR GYPSUM BOARD

A. Install interior gypsum board in the following locations:

1. Wallboard Type: As indicated on Drawings.
2. Type X: As indicated on Drawings.
3. Ceiling Type: Ceiling surfaces.
4. Mold-Resistant Type: As indicated on Drawings.

B. Single-Layer Application:

1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
2. On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.

    a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
    b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.

3. On Z-shaped furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

3.4 INSTALLATION OF TILE BACKING PANELS

A. Cementitious Backer Units: ANSI A108.11, at showers, tubs, and where indicated on Drawings and locations indicated to receive tile.

B. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

3.5 INSTALLATION OF TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Control Joints: Install control joints according to ASTM C840 and in specific locations approved by Architect for visual effect.

C. Interior Trim: Install in the following locations:

1. Cornerbead: Use at outside corners .
2. LC-Bead: Use at exposed panel edges.

D. Aluminum Trim: Install in locations indicated.

3.6 FINISHING OF GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints and damaged surface areas.

C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C840:

1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
2. Level 2: Panels that are substrate for tile.
3. Level 3: Panels that will receive textured finish.
4. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.

    a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."

E. Cementitious Backer Units: Finish according to manufacturer's written instructions.

3.7 PROTECTION

A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.

B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

C. Remove and replace panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092900

SECTION 093013 - CERAMIC TILING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Porcelain tile.
2. Glazed wall tile.
3. Thresholds.
4. Tile backing panels.
5. Waterproof membranes.
6. Crack isolation membranes.
7. Setting material.
8. Grout materials.

B. Related Requirements:

1. Section 079200 "Joint Sealants" for sealing of movement joints in tile surfaces.
2. Section 092900 "Gypsum Board" for tile backing panels.

1.2 DEFINITIONS

A. General: Definitions in ANSI A108 series of tile installation standards and in ANSI A137.1 apply to Work of this Section unless otherwise specified.

B. Face Size: Actual tile size, excluding spacer lugs.

C. Large Format Tile: Tile with at least one edge **15 inches** or longer.

D. Module Size: Actual tile size plus joint width indicated.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples for Initial Selection: For tile, grout, and accessories involving color selection or shade variation.

1.4 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of product, including product use classification.

B. Product Test Reports:

1. Tile-setting and -grouting products.
2. Certified porcelain tile.
3. Slip-resistance test reports from qualified independent testing agency.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Extra Stock Material: Furnish extra materials, from the same production run, to Owner that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Tile and Trim Units: Furnish quantity of full-size units equal to 3 percent of amount installed for each type, composition, color, pattern, and size indicated.
2. Grout: Furnish quantity of grout equal to 3 percent of amount installed for each type, composition, and color indicated.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirements in ANSI A137.1 for labeling tile packages.

B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.

C. Store aggregates where grading and other required characteristics can be maintained and contamination can be avoided.

D. Store liquid materials in unopened containers and protected from freezing.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Tile: Obtain tile of each type and color or finish from single source or producer.

1. Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.

2.2 PRODUCTS, GENERAL

A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.

1. Provide tile complying with Standard Grade requirements unless otherwise indicated.

B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.

2.3 PORCELAIN TILE

A. Porcelain Tile Type: Unglazed.

1. Basis-of-Design Product: Subject to compliance with requirements, provide DalTile or comparable product by one of the following:

a. Crossville, Inc.
b. Florida Tile, Inc.
c. Iris Ceramics U.S., a division of Stonepeak Ceramics, Inc.
d. Marazzi USA; a brand of Dal-Tile Corporation

2. Certification: Tile certified by the Porcelain Tile Certification Agency.
3. Face Size: 12" x 24".
4. Face Size Variation: Rectified.
5. Thickness: 1/4 inch.
6. Product Use Classification: Interior, Wet (IW).
7. Tile Color, Glaze, and Pattern: As selected by Architect from manufacturer's full range.
8. Grout Color: As selected by Architect from manufacturer's full range.
9. Precoat with temporary protective coating.
10. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide shapes as follows, selected from manufacturer's standard shapes:

a. Base Cap: Surface bullnose, module size same as adjoining flat tile.
b. Wainscot Cap: Surface bullnose, module size same as adjoining flat tile.
c. Wainscot Cap for Flush Conditions: Regular flat tile for conditions where tile wainscot is shown flush with wall surface above it; same size as adjoining flat tile.
d. External Corners: Surface bullnose, module size same as adjoining flat tile.
e. Internal Corners: Field-butted square corners.
f. Tapered Transition Tile: Shape designed to effect transition between thickness of tile floor and adjoining floor finishes of different thickness, tapered to provide reduction in thickness from 1/2 to 1/4 inch across nominal 4-inch dimension.

2.4 GLAZED WALL TILE

A. Glazed Wall Tile Type:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Daltile or comparable product by one of the following:

a. Crossville, Inc.
b. Marazzi USA; a brand of Dal-Tile Corporation

2. Face Size Variation: Rectified.
3. Thickness: **5/16 inch**.
4. Tile Color and Pattern: As selected by Architect from manufacturer's full range.
5. Grout Color: As selected by Architect from manufacturer's full range.
6. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide shapes as follows, selected from manufacturer's standard shapes:

a. Wainscot Cap for Flush Conditions: Regular flat tile for conditions where tile wainscot is shown flush with wall surface above it; same size as adjoining flat tile.
b. External Corners for Portland Cement Mortar Installations: Bullnose shape with radius of at least **3/4 inch** unless otherwise indicated.
c. External Corners for Thinset Mortar Installations: Surface bullnose; same size as adjoining flat tile.
d. Internal Corners: Field-butted square corners. For coved base and cap, use angle pieces designed to fit with stretcher shapes.

2.5 THRESHOLDS

A. General: Fabricate to sizes and profiles indicated or required to provide transition between adjacent floor finishes.

1. Bevel edges at 1:2 slope, with lower edge of bevel aligned with or up to **1/16 inch** above adjacent floor surface. Finish bevel to match top surface of threshold. Limit height of threshold to **1/2 inch** or less above adjacent floor surface.

B. Marble Thresholds: ASTM C503/C503M, with a minimum abrasion resistance of 10 in accordance with ASTM C1353/C1353M or ASTM C241/C241M and with honed finish.

1. Description:

a. Uniform, fine- to medium-grained white stone with gray veining.

2.6 TILE BACKING PANELS

A. Cementitious Backer Units: ANSI A118.9 and ASTM C1288 or ASTM C1325, with manufacturer's standard edges in maximum lengths available to minimize end-to-end butt joints.

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. CertainTeed; SAINT-GOBAIN
    b. James Hardie Building Products, Inc.
    c. PermaBASE Building Products, LLC provided by National Gypsum Company
    d. USG Corporation

2. Thickness: 1/2 inch.
3. Mold Resistance: ASTM D3273, score of 10 as rated in accordance with ASTM D3274.

2.7 WATERPROOF MEMBRANES

A. General: Manufacturer's standard product , selected from the following, that complies with ANSI A118.10 and ANSI A118.12 and is recommended by manufacturer for application indicated. Include reinforcement and accessories recommended by manufacturer.

B. Waterproof Membrane, Sheet: Polyethylene sheet faced on one or both sides with polyester fabric.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. ARDEX Americas
    b. Laticrete International, Inc.
    c. MAPEI Corporation
    d. Noble Company (The)
    e. Schluter Systems L.P.

2. Nominal Thickness: 0.02 inch.

2.8 CRACK ISOLATION MEMBRANES

A. General: Manufacturer's standard product , selected from the following, that complies with ANSI A118.12 for standard performance and is recommended by manufacturer for application indicated. Include reinforcement and accessories recommended by manufacturer.

B. Crack Isolation Membrane, Polyethylene Sheet: Polyethylene faced on both sides with polyester fabric.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Laticrete International, Inc.
    b. MAPEI Corporation
    c. Noble Company (The)

d. Schluter Systems L.P.

2.9 SETTING MATERIALS

A. Standard Dry-Set Mortar (Thinset): ANSI A118.1.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. ARDEX Americas
b. Bostik; Arkema
c. H.B. Fuller Construction Products Inc. / TEC
d. Laticrete International, Inc.
e. MAPEI Corporation
f. Parex, a Sika brand
g. Siena Tile & Stone Installation Products; Omega Products International
h. Southern Grouts & Mortars, Inc

2. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to other requirements in ANSI A118.1.

2.10 GROUT MATERIALS

A. Water-Cleanable Epoxy Grout: ANSI A118.3 , with a VOC content of 65 g/L or less.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. ARDEX Americas
b. Bostik; Arkema
c. H.B. Fuller Construction Products Inc. / TEC
d. Laticrete International, Inc.
e. MAPEI Corporation
f. Parex, a Sika brand
g. Sika Corporation

2. Provide product capable of withstanding continuous and intermittent exposure to temperatures of up to **140 and 212 deg F**, respectively, and certified by manufacturer for intended use.

B. Grout for Pregrouted Tile Sheets: Same product used in factory to pregrout tile sheets.

2.11 MISCELLANEOUS MATERIALS

A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting and adhesive materials for

installations indicated.

B. Vapor-Retarder Membrane: Polyethylene sheeting, ASTM D4397, **4.0 mils** thick.

C. Metal Flooring Transitions: Profile designed specifically for flooring applications; height to match tile and setting-bed thickness.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Blanke Corporation
b. Dural USA, Inc.
c. Progress Profiles America Inc.
d. Schluter Systems L.P.

2. Description: L-shaped.
3. Material and Finish: Metallic or combination of metal and PVC or neoprene base; polished nickel anodized aluminum exposed-edge material.

D. Temporary Protective Coating: Formulated to protect exposed surfaces of tile against adherence of mortar and grout; compatible with tile, mortar, and grout products and easily removable after grouting is completed without damaging grout or tile.

E. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.

F. Grout Sealer: Grout manufacturer's standard product for sealing grout joints that does not change color or appearance of grout.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

1. Verify that substrates for setting tile are firm; dry; clean; free of coatings that are incompatible with tile-setting materials, including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.
2. Verify that concrete substrates for tile floors installed with thinset mortar comply with surface finish requirements in ANSI A108.01 for installations indicated.

a. Verify that surfaces that received a steel trowel finish have been mechanically scarified.

b. Verify that protrusions, bumps, and ridges have been removed by sanding or grinding.

3. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed.
4. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove coatings, including curing compounds or other coatings, that are incompatible with tile-setting materials.

B. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with thinset mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.

C. Where indicated, prepare substrates to receive waterproof membrane by applying a reinforced mortar bed that complies with ANSI A108.1 and is sloped **1/4 inch per foot** toward drains.

D. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

E. Substrate Flatness:

1. For tile shorter than **15 inches**, confirm that structure or substrate is limited to variation of **1/4 inch in 10 ft.** from the required plane, and no more than **1/16 inch in 12 inches** when measured from tile surface high points.
2. For large format tile, tile with at least one edge **15 inches** or longer, confirm that structure or substrate is limited to **1/8 inch in 10 ft.** from the required plane, and no more than **1/16 inch in 24 inches** when measured from tile surface high points.

F. Field-Applied Temporary Protective Coating: If indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

3.3 INSTALLATION OF CERAMIC TILE SYSTEM

A. Install tile backing panels and treat joints in accordance with ANSI A108.11 and manufacturer's written instructions for type of application indicated.

B. Install waterproof membrane to comply with ANSI A108.13 and manufacturer's written

instructions to produce waterproof membrane of uniform thickness that is bonded securely to substrate.

1. Allow waterproof membrane to cure and verify by testing that it is watertight before installing tile or setting materials over it.

C. Install crack isolation membrane to comply with ANSI A108.17 and manufacturer's written instructions to produce membrane of uniform thickness that is bonded securely to substrate.

1. Allow crack isolation membrane to cure before installing tile or setting materials over it.

D. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.

1. Add materials, water, and additives in accurate proportions.
2. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

E. Install tile in accordance with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of ANSI A108 series that are referenced in TCNA installation methods and specified in tile installation schedules, and apply to types of setting and grouting materials used.

1. For the following installations, follow procedures in ANSI A108 series of tile installation standards for providing 95 percent mortar coverage:

    a. Exterior tile floors and walls.
    b. Tile floors in wet areas.
    c. Tile floors in laundries.
    d. Tile floors consisting of tiles **8 by 8 inches** or larger.
    e. Tile floors consisting of rib-backed tiles.

2. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
3. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
4. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.
5. Where accent tile differs in thickness from field tile, vary setting-bed thickness so that tiles are flush.
6. Jointing Pattern: Lay tile in staggered pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.

a. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets, so joints between sheets are not apparent in finished Work.
b. Where adjoining tiles on floor, base, walls, or trim are specified or indicated to be same size, align joints.
c. Where tiles are specified or indicated to be whole integer multiples of adjoining tiles on floor, base, walls, or trim, align joints unless otherwise indicated.

F. Movement Joints: Provide movement joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated on Drawings. Form joints during installation of setting materials, mortar beds, and tile. Keep joints free of dirt, debris, and setting materials prior to filling with sealants. Do not saw-cut joints after installing tiles.

1. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.

G. Thresholds: Install stone and solid surface thresholds in same type of setting bed as adjacent floor unless otherwise indicated.

1. Do not extend crack isolation membrane under thresholds set in modified dry-set mortar. Fill joints between such thresholds and adjoining tile set on crack isolation membrane with elastomeric sealant.

H. Metal Flooring Transitions: Install where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with or below top of tile and no threshold is indicated.

I. Metal Wall Trim: Install at locations indicated on Drawings.

J. Grout Sealer: Apply grout sealer to cementitious grout joints in tile floors in accordance with manufacturer's written instructions. As soon as sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.

3.4 FIELD QUALITY CONTROL

A. Water Test:

1. Test of waterproofing membrane in showers and similar areas to be performed by Installation Contractor before setting tile.

a. Perform test after 24 hours of waterproof membrane installation.
b. Insert test plug in drain or waste line.
c. Fill shower base with water, high enough that the membrane-to-drain connection and floor-to-wall transition can be evaluated, and mark wall.
d. Check for leaks after 24 hours.

B. Nonconforming Work:

1. Waterproof membrane will be considered defective if water level has dropped.
2. Remove and replace defective components and retest.

3.5 ADJUSTING AND CLEANING

A. Remove and replace tile that is damaged or that does not match adjoining tile. Provide new matching units, installed as specified and in a manner to eliminate evidence of replacement.

B. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.

1. Remove grout residue from tile as soon as possible.
2. Clean grout smears and haze from tile in accordance with tile and grout manufacturer's written instructions. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.

3.6 PROTECTION

A. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.

B. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.

C. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

END OF SECTION 093013

SECTION 096519 - RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Solid vinyl floor tile.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: Full-size units of each color, texture, and pattern of floor tile required.

1.3 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of floor tile to include in maintenance manuals.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Floor Tile: Furnish one box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than **50 deg F** or more than **90 deg F**. Store floor tiles on flat surfaces.

1.6 FIELD CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F, in spaces to receive floor tile during the following periods:

1. 48 hours before installation.
2. During installation.

3. 48 hours after installation.

B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.

C. Close spaces to traffic during floor tile installation.

D. Close spaces to traffic for 48 hours after floor tile installation.

E. Install floor tile after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 SOLID VINYL FLOOR TILE

A. Basis-of-Design Product: Subject to compliance with requirements, provide Mannington Commercial or comparable product by one of the following:

1. Armstrong Flooring, Inc.
2. Shaw Industries Group, Inc.; Berkshire Hathaway Company

B. Tile Standard: ASTM F1700.

1. Class: Class III, Printed Film Vinyl Tile.
2. Type: B, Embossed Surface.

C. Thickness: 0.098" (2.5mm).

D. Size: 6" x 36" or 7.25 x 48" (size dependent upon style selected by Architect/Owner).

E. Colors and Patterns: Spacia Collection - Wood by Mannington Commercial or approved equal. Color and Pattern to be selected by Architect from Manufacturer's Full Range..

2.2 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by floor tile manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by floor tile and adhesive manufacturers to suit floor tile and substrate conditions indicated.

C. Floor Polish: Provide protective, liquid floor-polish products recommended by floor tile manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.

B. Concrete Substrates: Prepare according to ASTM F710.

1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.
3. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.
4. Moisture Testing: Perform tests so that each test area does not exceed 200 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.

a. Anhydrous Calcium Chloride Test: ASTM F1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
b. Relative Humidity Test: Using in-situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install floor tiles until materials are the same temperature as space where they are to be installed.

1. At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.

E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

3.3 FLOOR TILE INSTALLATION

A. Comply with manufacturer's written instructions for installing floor tile.

B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.

1. Lay tiles in pattern indicated.

C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.

1. Lay tiles with grain running in one direction.

D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.

E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.

F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.

G. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in installation areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.

H. Adhere floor tiles to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.4 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting floor tile.

B. Perform the following operations immediately after completing floor tile installation:

1. Remove adhesive and other blemishes from surfaces.
2. Sweep and vacuum surfaces thoroughly.
3. Damp-mop surfaces to remove marks and soil.

C. Protect floor tile from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Cover floor tile until Substantial Completion.

END OF SECTION 096519

SECTION 099113 - EXTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Surface preparation of exterior substrates and application of the following:

1. Primers.
2. Water-based finish coatings.
3. Floor sealers and paints.

B. Related Requirements:

1. Section 055213 "Pipe and Tube Railings" for shop priming pipe and tube railings.
2. Section 099123 "Interior Painting."
3. Section 099300 "Staining and Transparent Finishing" for surface preparation and application of wood stains and transparent finishes on exterior wood substrates.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include preparation requirements and application instructions.
2. Indicate VOC content.

B. Samples for Initial Selection: For each type of topcoat product.

C. Samples for Verification: For each type of paint system and each color and gloss of topcoat. Submit paint manufacturer's standard printed cards for verification Samples.

D. Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in applicable exterior painting schedule articles to cross-reference paint systems specified in this Section. Include color designations.

1.3 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match paint products applied and that are packaged with protective covering for storage and identified with labels describing contents.

1. Paint Products: 2 percent, but not less than 1 gal. of each material and color applied.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than **45 deg F**.

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.5 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between **50 and 95 deg F**.

B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than **5 deg F** above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain each paint product from single source from single manufacturer.

2.2 EXTERIOR PAINTS, GENERAL

A. Exterior Paints: Subject to compliance with requirements, provide product listed in product types below and applicable exterior painting schedule articles for the paint category indicated.

B. Material Compatibility:

1. Materials for use within each paint system must be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by topcoat manufacturer for use in paint system and on substrate indicated.
3. Flat Paints and Coatings: 50 g/L.
4. Nonflat Paints and Coatings: 50 g/L.
5. Dry-Fog Coatings: 150 g/L.
6. Primers, Sealers, and Undercoaters: 100 g/L.
7. Rust-Preventive Coatings: 100 g/L.
8. Zinc-Rich Industrial Maintenance Primers: 100 g/L.
9. Pretreatment Wash Primers: 420 g/L.
10. Shellacs, Clear: 730 g/L.
11. Shellacs, Pigmented: 550 g/L.

C. Colors: As selected by Architect from manufacturer's full range.

1. 10 percent or less of surface area will be painted with deep tones.

2.3 PRIMERS

A. Exterior Wood Preservative: Solvent-based, zinc or copper napthenate, penetrating antifungal treatment for exterior wood.

B. Exterior, Latex Wood Primer: White, waterborne-emulsion primer formulated for resistance to extractive bleeding, mold, and microbials; for hiding stains; and for use on exterior wood substrates.

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. Benjamin Moore & Co.
b. Sherwin-Williams Company (The)
c. The Pittsburgh Paints Company

C. Latex Block Filler: Water-based, pigmented, high-solids, emulsion coating formulated to bridge and fill porous surfaces of CMU substrates in preparation for specified subsequent coatings.

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. Benjamin Moore & Co.
b. Sherwin-Williams Company (The)
c. The Pittsburgh Paints Company

D. Water-Based, Rust-Inhibitive Primer: Corrosion-resistant, water-based-emulsion primer; formulated for resistance to flash rusting when applied to cleaned, ferrous metal substrates subject to mildly corrosive environments.

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. Benjamin Moore & Co.
b. Sherwin-Williams Company (The)
c. The Pittsburgh Paints Company

E. Water-Based, Galvanized-Metal Primer: Corrosion-resistant, pigmented, acrylic primer; formulated for use on cleaned/etched galvanized metal substrates to prepare it for subsequent water-based coatings.

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. Benjamin Moore & Co.
b. Sherwin-Williams Company (The)
c. The Pittsburgh Paints Company

F. Quick-Drying Aluminum Primer: Corrosion-resistant, solvent-based, alkyd or modified-alkyd primer formulated for quick-drying capabilities and for use on prepared aluminum substrates.

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. The Pittsburgh Paints Company
b. Benjamin Moore
c. Sherwin Williams

G. Wood-Knot Sealer: White shellac or other sealer recommended in writing by manufacturer for this purpose.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Behr Paint Company (Behr Process LLC)
b. Benjamin Moore & Co.
c. Sherwin-Williams Company (The)

2.4 WATER-BASED FINISH COATINGS

A. Exterior Latex Paint: Water-based, pigmented coating; formulated for alkali, mold, microbial, and water resistance and for use on exterior substrates.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Benjamin Moore & Co.
b. Sherwin-Williams Company (The)
c. The Pittsburgh Paints Company

2.5 SOLVENT-BASED FINISH COATINGS

A. Aluminum Paint: Aliphatic, solvent-based coating consisting of varnish or alkyd binder combined with aluminum pigment that is formulated for use as a stain-blocking coating and sealer, is able to be recoated with conventional alkyd and latex paints, and for use on wood, metal, bituminous-coated, and prepared masonry substrates.

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. Benjamin Moore & Co.
b. Sherwin-Williams Company (The)
c. The Pittsburgh Paints Company

2.6 FLOOR SEALERS AND PAINTS

A. Concrete Stain: Penetrating semitransparent stain specifically manufactured for interior and exterior concrete horizontal and vertical surfaces.

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. Benjamin Moore & Co.
b. H&C Decorative Concrete Products; a brand of Sherwin-Williams Co.
c. Sherwin-Williams Company (The)
d. The Pittsburgh Paints Company

B. Water-Based, Concrete-Floor Sealer: Clear, water-based, acrylic-copolymer-emulsion sealer formulated for oil, gasoline, alkali, and water resistance and for use on concrete traffic substrates.

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. H&C Decorative Concrete Products; a brand of Sherwin-Williams Co.
b. Hempel (USA), Inc.
c. Sherwin-Williams Company (The)
d. The Pittsburgh Paints Company

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Concrete: 12 percent.
2. Cementitious Composition Board: 12 percent.

3. Masonry (Clay and CMU): 12 percent.
4. Wood: 15 percent.
5. Portland Cement Plaster (Stucco): 12 percent. Verify that plaster is fully cured.

C. Verify suitability of substrates, including surface conditions and compatibility, with finishes and primers. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of substrates and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions applicable to substrates and paint systems indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems specified in this Section.

D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.

E. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.

F. Steel Substrates: Remove loose rust, loose mill scale, loose shop primer, and other loose foreign matter. Clean using methods recommended in writing by paint manufacturer but not less than the following:

1. SSPC-SP 2.

G. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed substrates.

H. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of

subsequently applied paints.

I. Aluminum Substrates: Remove loose surface oxidation.

J. Wood Substrates:

1. Scrape and clean knots. Before applying primer, apply coat of knot sealer recommended in writing by topcoat manufacturer for exterior use in paint system indicated.
2. Sand surfaces that will be exposed to view and remove sanding dust.
3. Prime edges, ends, faces, undersides, and backsides of wood.
4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

K. Plastic Trim Fabrication Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.

3.3 APPLICATION OF EXTERIOR PAINT PRODUCTS

A. Apply paints in accordance with manufacturer's written instructions.

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
3. Paint both sides and edges of exterior doors and entire exposed surface of exterior door frames.
4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
5. Primers specified in applicable exterior painting schedule articles may be omitted on items that are factory primed or factory finished if compatible with intermediate and topcoat coatings and acceptable to intermediate and topcoat paint manufacturers.

B. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

C. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

D. Painting, Fire-Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:

1. Paint the following work where exposed to view:

a. Uninsulated metal piping.
b. Uninsulated plastic piping.
c. Pipe hangers and supports.
d. Metal conduit.
e. Plastic conduit.

f. Tanks that do not have factory-applied final finishes.

3.4 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

1. Do not clean equipment with free-draining water and prevent solvents, thinners, cleaners, and other contaminants from entering into waterways, sanitary and storm drain systems, and ground.
2. Dispose of contaminants in accordance with requirements of authorities having jurisdiction.
3. Allow empty paint cans to dry before disposal.
4. Collect waste paint by type and deliver to recycling or collection facility.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.5 EXTERIOR PAINTING SCHEDULE, CONCRETE SUBSTRATES

A. Horizontal (Traffic) Surfaces:

1. Water-Based Concrete Floor Sealer System:

a. Prime Coat: Matching topcoat.
b. Intermediate Coat: Matching topcoat.
c. Topcoat: Water-based, concrete-floor sealer.

3.6 EXTERIOR PAINTING SCHEDULE, CEMENTITIOUS SUBSTRATES

A. Cementitious Composition Board Substrates: Panels.

1. Latex System:

a. Prime Coat: Matching topcoat.
b. Intermediate Coat: Matching topcoat.
c. Topcoat: Exterior latex paint, low sheen.

B. Portland Cement Plaster (Stucco) Substrates:

1. Latex System:

    a. Prime Coat: Matching topcoat.
    b. Intermediate Coat: Matching topcoat.
    c. Topcoat: Exterior latex paint, low sheen.

3.7 EXTERIOR PAINTING SCHEDULE, MASONRY SUBSTRATES

A. Clay Masonry Substrates:

1. Latex System:

    a. Prime Coat: Matching topcoat.
    b. Intermediate Coat: Matching topcoat.
    c. Topcoat: Exterior latex paint, low sheen.

B. CMU Substrates:

1. Latex System:

    a. Prime Coat: Latex block filler.
    b. Intermediate Coat: Matching topcoat.
    c. Topcoat: Exterior latex paint, low sheen.

3.8 EXTERIOR PAINTING SCHEDULE, METAL SUBSTRATES

A. Steel and Iron Substrates:

1. Water-Based, Light Industrial Coating System:

    a. Prime Coat: Acrylic metal primer.
    b. Intermediate Coat: Matching topcoat.
    c. Topcoat: Exterior, water-based, light industrial coating, low sheen.

B. Galvanized Metal Substrates:

1. Latex System:

    a. Prime Coat: Water-based, galvanized-metal primer.
    b. Intermediate Coat: Matching topcoat.
    c. Topcoat: Exterior latex paint, low sheen.

C. Aluminum (Not Anodized or Otherwise Coated) Substrates:

1. Latex System:

    a. Prime Coat: Quick-dry aluminum primer.
    b. Intermediate Coat: Matching topcoat.

c. Topcoat: Exterior latex paint, low sheen.

2. Aluminum Paint System:

a. Pretreatment Prime Coat: Vinyl wash primer.
b. Prime Coat: Quick-dry aluminum primer.
c. Intermediate Coat: Matching topcoat.
d. Topcoat: Aluminum paint.

3.9 EXTERIOR PAINTING SCHEDULE, WOOD SUBSTRATES

A. Glue-Laminated Wood Substrates:

1. Latex over Latex Primer System:

a. Prime Coat: Exterior, latex wood primer.
b. Intermediate Coat: Matching topcoat.
c. Topcoat: Exterior latex paint, low sheen.

B. Exposed Wood-Framed Substrates:

1. Latex over Latex Primer System:

a. Prime Coat: Exterior, latex wood primer.
b. Intermediate Coat: Matching topcoat.
c. Topcoat: Exterior latex paint, low sheen.

C. Dressed-Wood Substrates: Wood trim Architectural woodwork.

1. Latex over Latex Primer System:

a. Prime Coat: Exterior, latex wood primer.
b. Intermediate Coat: Matching topcoat.
c. Topcoat: Exterior latex paint, low sheen.

D. Wood-Based Panel Substrates:

1. Latex over Latex Primer System:

a. Prime Coat: Exterior, latex wood primer.
b. Intermediate Coat: Matching topcoat.
c. Topcoat: Exterior latex paint, low sheen.

3.10 EXTERIOR PAINTING SCHEDULE, MISCELLANEOUS SUBSTRATES

A. Fiberglass Substrates:

1. Latex System:

a. Prime Coat: Solvent-based bonding primer.
b. Intermediate Coat: Matching topcoat.
c. Topcoat: Exterior latex paint, low sheen.

B. Plastic Trim Fabrication Substrates:

1. Latex System:

a. Prime Coat: Water -based bonding primer.
b. Intermediate Coat: Matching topcoat.
c. Topcoat: Exterior latex paint, low sheen.

END OF SECTION 099113

SECTION 099123 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Surface preparation of interior substrates and application of the following:

1. Primers.
2. Water-based finish coatings.

B. Related Requirements:

1. Section 055213 "Pipe and Tube Railings" for shop priming pipe and tube railings.
2. Section 099113 "Exterior Painting."
3. Section 099300 "Staining and Transparent Finishing" for surface preparation and application of wood stains and transparent finishes on interior wood substrates.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include preparation requirements and application instructions.
2. Indicate VOC content.

B. Samples: For each type of topcoat product.

C. Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in applicable interior painting schedule articles to cross-reference paint systems specified in this Section. Include color designations.

1.3 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match paint products applied and that are packaged with protective covering for storage and identified with labels describing contents.

1. Paint Products: 2 percent, but not less than 1 gal. of each material and color applied.

1.4 MOCKUPS

A. Apply mockups of each paint system indicated and each color and finish selected to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.

1. Architect will select one surface to represent surfaces and conditions for application of each paint system.

    a. Vertical and Horizontal Surfaces: Provide samples of at least **100 sq. ft.**.

2. Final approval of color selections will be based on mockups.

    a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Owner specifically approves such deviations by Change Order.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than **45 deg F**.

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.6 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between **50 and 95 deg F**.

B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures of less than **5 deg F** above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain each paint product from single source from single manufacturer.

2.2 INTERIOR PAINTS, GENERAL

A. Interior Paints: Subject to compliance with requirements, available products that may be incorporated into the Work include but are not limited to products listed in product types below and applicable interior painting schedule articles for the paint category indicated.

B. Material Compatibility:

1. Materials for use within each paint system must be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by topcoat manufacturer for use in paint system and on substrate indicated.

C. Colors: As selected by Architect from manufacturer's full range.

1. 10 percent of surface area will be painted with deep tones.

2.3 PRIMERS

A. Latex Block Filler: Water-based, pigmented, high-solids, emulsion coating formulated to bridge and fill porous surfaces of CMU substrates in preparation for specified subsequent coatings.

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. Benjamin Moore & Co.
b. Sherwin-Williams Company (The)

B. Interior, Latex Primer for Wood: Waterborne-emulsion primer formulated for resistance to extractive bleeding, mold, and microbials; for hiding stains; and for use on interior wood substrates.

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. Benjamin Moore & Co.
b. Sherwin-Williams Company (The)

2.4 WATER-BASED FINISH COATINGS

A. Interior Latex Paint: Pigmented, water-based coating for use on interior primed/sealed plaster and gypsum board, and on primed wood and metals.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Benjamin Moore & Co.
b. Sherwin-Williams Company (The)
c. The Pittsburgh Paints Company

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Concrete: 12 percent.
2. Cementitious Composition Board: 12 percent.
3. Masonry (Clay and CMU): 12 percent.
4. Wood: 15 percent.
5. Gypsum Board: 12 percent. Verify that finishing compound is dry and sanded smooth.
6. Plaster: 12 percent. Verify that plaster is fully cured.

C. Verify suitability of substrates, including surface conditions and compatibility, with finishes and primers. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions applicable to substrates and paint systems indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.

E. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints to be painted exceeds that permitted in

manufacturer's written instructions.

F. Steel Substrates: Remove loose rust, loose mill scale, loose shop primer, and other loose foreign matter. Clean using methods recommended in writing by paint manufacturer but not less than the following:

1. SSPC-SP 2.

G. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

H. Galvanized Metal Substrates: Remove grease and oil residue from galvanized metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

I. Aluminum Substrates: Remove loose surface oxidation.

J. Wood Substrates:

1. Scrape and clean knots. Before applying primer, apply coat of wood-knot sealer.
2. Sand surfaces that will be exposed to view and remove sanding dust.
3. Prime edges, ends, faces, undersides, and backsides of wood.
4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

K. Plastic Trim Fabrication Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.

3.3 APPLICATION OF INTERIOR PAINT PRODUCTS

A. Apply paints in accordance with manufacturer's written instructions.

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
5. Primers specified in the applicable interior painting schedule articles may be omitted on items that are factory primed or factory finished if compatible with intermediate and topcoat coatings and acceptable to intermediate and topcoat paint manufacturers.

B. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

C. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

D. Painting Fire-Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:

1. Paint the following work where exposed to view in occupied spaces:

a. Equipment, including panelboards.
b. Uninsulated metal piping.
c. Uninsulated plastic piping.
d. Pipe hangers and supports.
e. Metal conduit.
f. Plastic conduit.
g. Other items as directed by Architect.

2. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

3.4 CLEANING

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

1. Do not clean equipment with free-draining water and prevent solvents, thinners, cleaners, and other contaminants from entering into waterways, sanitary and storm drain systems, and ground.
2. Dispose of contaminants in accordance with requirements of authorities having jurisdiction.
3. Allow empty paint cans to dry before disposal.
4. Collect waste paint by type and deliver to recycling or collection facility.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

3.5 PROTECTION

A. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

B. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 INTERIOR PAINTING SCHEDULE, CEMENTITIOUS SUBSTRATES

A. Cementitious Composition Board Substrates: Panels.

1. Latex System: Walls

a. Prime Coat: Alkali-resistant, water-based primer.
b. Intermediate Coat: Matching topcoat.
c. Topcoat: Interior latex paint.

1) Gloss and Sheen Level: Eggshell.

3.7 INTERIOR PAINTING SCHEDULE, MASONRY SUBSTRATES

A. Clay Masonry Substrates:

1. Latex System: Existing brick enclosed by Renovation

a. Prime Coat: Alkali-resistant, water-based primer.
b. Intermediate Coat: Matching topcoat.
c. Topcoat: Interior latex paint.

1) Gloss and Sheen Level: Eggshell.

B. CMU Substrates:

1. Latex System: Walls

a. Block Filler: Latex block filler.
b. Intermediate Coat: Matching topcoat.
c. Topcoat: Interior latex paint.

1) Gloss and Sheen Level: Eggshell.

3.8 INTERIOR PAINTING SCHEDULE, METAL SUBSTRATES

A. Steel and Iron Substrates:

1. Latex System, Alkyd Primer: Steel Doors and Frames

a. Prime Coat: Alkyd metal primer.
b. Intermediate Coat: Matching topcoat.
c. Topcoat: Interior latex paint.

1) Gloss and Sheen Level: Semigloss.

B. Aluminum (Not Anodized or Otherwise Coated) Substrates:

1. Latex System: Misc.

    a. Prime Coat: Quick-drying aluminum primer.
    b. Intermediate Coat: Matching topcoat.
    c. Topcoat: Interior latex paint.

        1) Gloss and Sheen Level: Semigloss.

3.9 INTERIOR PAINTING SCHEDULE, WOOD SUBSTRATES

A. Exposed Wood Framed Substrates:

1. Latex over Latex Primer System: Miscellaneous wood not specified as stained.

    a. Prime Coat: Interior, latex primer for wood.
    b. Intermediate Coat: Matching topcoat.
    c. Topcoat: Interior latex paint.

        1) Gloss and Sheen Level: Semigloss.

B. Finish Carpentry Substrates: Wood trim Doors.

1. Latex over Latex Primer System: PT

    a. Prime Coat: Interior, latex primer for wood.
    b. Intermediate Coat: Matching topcoat.
    c. Topcoat: Interior latex paint.

        1) Gloss and Sheen Level: Semigloss.

C. Architectural Woodwork Substrates: Wood paneling and Casework.

1. Latex over Latex Primer System: "PT" or "Painted"

    a. Prime Coat: Interior, latex primer for wood.
    b. Intermediate Coat: Matching topcoat.
    c. Topcoat: Interior latex paint.

        1) Gloss and Sheen Level: Semigloss.

3.10 INTERIOR PAINTING SCHEDULE, GYPSUM-BASED SUBSTRATES

A. Gypsum Board and Plaster Substrates:

1. Latex over Latex Sealer System: "PT" of "Painted"

    a. Prime Coat: Interior latex primer sealer.
    b. Intermediate Coat: Matching topcoat.

c. Topcoat: Interior latex paint.

1) Gloss and Sheen Level: Eggshell at walls and Flat at ceilings.

3.11 INTERIOR PAINTING SCHEDULE, MISCELLANEOUS SUBSTRATES

A. Fiberglass Substrates:

1. Latex System: "PT" or "Painted"

a. Prime Coat: Water-based bonding primer.
b. Intermediate Coat: Matching topcoat.
c. Topcoat: Interior latex paint.

1) Gloss and Sheen Level: Eggshell.

B. Plastic Trim Fabrication Substrates:

1. Latex System: "PT" or "Painted"

a. Prime Coat: Water-based bonding primer.
b. Intermediate Coat: Matching topcoat.
c. Topcoat: Interior latex paint.

1) Gloss and Sheen Level: Eggshell.

C. Spray-Textured Ceiling Substrates:

1. Latex, Flat System: Spray applied: "PT" or "Painted"

a. Prime Coat: Matching topcoat.
b. Topcoat: Interior latex paint.

1) Gloss and Sheen Level: Flat.

END OF SECTION 099123

SECTION 099300 - STAINING AND TRANSPARENT FINISHING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wood stains.
2. Transparent finishes.

B. Related Requirements:

1. Section 099123 "Interior Painting" for stains and transparent finishes on concrete floors.

1.2 ACTION SUBMITTALS

A. Product Data:

1. For each type of product.
2. Include preparation requirements and application instructions.
3. Indicate VOC content.

B. Samples for Initial Selection: Manufacturer's standard color sheets, showing full range of available colors for each type of exposed finish.

C. Samples for Verification: Sample for each type of finish system and in each color and gloss of finish required on representative samples of actual wood substrates.

1. Size: 8 inches square.
2. Apply coats on Samples in steps to show each coat required for system.
3. Label each Sample for location and application area.

D. Product List: Cross-reference to finish system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

1.3 MAINTENANCE MATERIAL SUBMITTALS

A. Extra Stock Material: Furnish extra materials , from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Stains and Transparent Finishes: 2 percent, but not less than 1 gal. of each material and color applied.

1.4 MOCKUPS

A. Apply mockups of each finish system indicated and each color selected to verify preliminary selections made under Sample submittals , to demonstrate aesthetic effects and to set quality standards for materials and execution.

1. Architect will select one surface to represent surfaces and conditions for application of each type of finish system and substrate.

a. Vertical and Horizontal Surfaces: Provide samples of at least **100 sq. ft.**.

2. Final approval of stain color selections will be based on mockups.

a. If preliminary stain color selections are not approved, apply additional mockups of additional stain colors selected by Architect at no added cost to Owner.

3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than **45 deg F**.

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.6 FIELD CONDITIONS

A. Apply finishes only when temperature of surfaces to be finished and ambient air temperatures are between **50 and 95 deg F**.

B. Do not apply finishes when relative humidity exceeds 85 percent, at temperatures of less than **5 deg F** above the dew point, or to damp or wet surfaces.

C. Do not apply exterior finishes in snow, rain, fog, or mist.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Source Limitations: Obtain each coating product from single source from single manufacturer.

2.2 STAINING AND TRANSPARENT FINISHING

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. Benjamin Moore & Co.
2. Pratt & Lambert; a subsidiary of The Sherwin-Williams Company
3. Sherwin-Williams Company (The)
4. The Pittsburgh Paints Company

B. Material Compatibility:

1. Provide materials for use within each coating system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.

C. Stain Colors: As selected by Architect from manufacturer's full range.

2.3 WOOD STAINS

A. Stain, Interior, Semitransparent, for Interior Wood: Solvent-based, oil or oil/alkyd, semitransparent, pigmented stain for new interior wood surfaces that are to be finished with a clear varnish.

2.4 TRANSPARENT FINISHES

A. Varnish, Interior Polyurethane, Moisture Cured, Gloss: Solvent-based, moisture-curing polyurethane clear-coating with a gloss finish for interior wood surfaces,

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Interior Wood Substrates: 13 percent, when measured with an electronic moisture meter.

C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

D. Proceed with finish application only after unsatisfactory conditions have been corrected.

1. Beginning finish application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

A. Remove hardware, covers, plates, and similar items already in place that are removable. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and finishing.

1. After completing finishing operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

B. Clean and prepare surfaces to be finished according to manufacturer's written instructions for each substrate condition and as specified.

1. Remove dust, dirt, oil, and grease by washing with a detergent solution; rinse thoroughly with clean water and allow to dry. Remove grade stamps and pencil marks by sanding lightly. Remove loose wood fibers by brushing.
2. Remove mildew by scrubbing with a commercial wash formulated for mildew removal and as recommended by stain manufacturer.

C. Interior Wood Substrates:

1. Scrape and clean knots, and apply coat of knot sealer before applying primer.
2. Apply wood filler paste to open-grain woods to produce smooth, glasslike finish.
3. Sand surfaces exposed to view and dust off.
4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dry.

3.3 APPLICATION

A. Apply finishes according to manufacturer's written instructions.

1. Use applicators and techniques suited for finish and substrate indicated.
2. Finish surfaces behind movable equipment and furniture same as similar exposed surfaces.
3. Do not apply finishes over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

B. Apply finishes to produce surface films without cloudiness, holidays, lap marks, brush marks, runs, ropiness, or other surface imperfections.

3.4 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing finish application, clean spattered surfaces. Remove spattered materials by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from finish application. Correct damage by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced finished wood surfaces.

3.5 INTERIOR WOOD-FINISH-SYSTEM SCHEDULE

A. Wood Substrates, Glued-Laminated Construction:

1. Polyurethane Varnish over Stain System ST or Stained:

a. Stain Coat: Stain, semitransparent, for interior wood.
b. First Intermediate Coat: Polyurethane varnish matching topcoat.
c. Second Intermediate Coat: Polyurethane varnish matching topcoat.
d. Topcoat: Varnish, interior, polyurethane, oil modified, satin.

B. Wood Substrates, Exposed Framing:

1. Polyurethane Varnish over Stain System :

a. Stain Coat: Stain, semitransparent, for interior wood.
b. First Intermediate Coat: Polyurethane varnish matching topcoat.
c. Second Intermediate Coat: Polyurethane varnish matching topcoat.
d. Topcoat: Varnish, interior, polyurethane, oil modified, satin.

C. Wood Substrates, Wood Trim Architectural Woodwork Windows:

1. Polyurethane Varnish over Stain System :

a. Stain Coat: Stain, semitransparent, for interior wood.
b. First Intermediate Coat: Polyurethane varnish matching topcoat.
c. Second Intermediate Coat: Polyurethane varnish matching topcoat.
d. Topcoat: Varnish, interior, polyurethane, oil modified, satin.

END OF SECTION 099300

SECTION 101423.16 - ROOM-IDENTIFICATION PANEL SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes room-identification signs that are directly attached to the building.

1.2 DEFINITIONS

A. Accessible: In accordance with the accessibility standard.

1.3 COORDINATION

A. Furnish templates for placement of sign-anchorage devices embedded in permanent construction by other installers.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For room-identification signs.

1. Include fabrication and installation details and attachments to other work.
2. Show sign mounting heights, locations of supplementary supports to be provided by other installers, and accessories.
3. Show message list, typestyles, graphic elements , and layout for each sign at least half size.

C. Samples for Initial Selection: For each type of sign assembly, exposed component, and exposed finish.

1. Include representative Samples of available typestyles and graphic symbols.

D. Samples for Verification: For each type of sign assembly showing all components and with the required finish(es), in manufacturer's standard size unless otherwise indicated and as follows:

1. Room-Identification Signs: Full-size Sample.
2. Variable Component Materials: Full-size Sample of each base material, character (letter, number, and graphic element) in each exposed color and finish not included in Samples above.
3. Full-size Samples, if approved, will be returned to Contractor for use in Project.

E. Product Schedule: For room-identification signs. Use same designations indicated on Drawings

or specified.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For signs to include in maintenance manuals.

1.6 FIELD CONDITIONS

A. Field Measurements: Verify locations of anchorage devices embedded in permanent construction by other installers by field measurements before fabrication, and indicate measurements on Shop Drawings.

1.7 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Deterioration of finishes beyond normal weathering.
b. Deterioration of embedded graphic image.
c. Separation or delamination of sheet materials and components.

2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Accessibility Standard: Comply with applicable provisions in the USDOJ's "2010 ADA Standards for Accessible Design" and ICC A117.1.

2.2 ROOM-IDENTIFICATION SIGNS

A. Room-Identification Sign: Sign with smooth, uniform surfaces; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. ACE Sign Systems, Inc.
b. APCO Graphics, Inc
c. inpro Corporation

2. Sign-Panel Perimeter: Finish edges smooth.

    a. Edge Condition at Vertical Edges at Horizontal Edges: Square cut.
    b. Corner Condition in Elevation: Rounded.

3. Mounting: Manufacturer's standard method for substrates indicated with concealed anchors.
4. Text and Typeface: Accessible raised characters and Braille typeface as selected by Architect from manufacturer's full range. Finish raised characters to contrast with background color, and finish Braille to match background color.

2.3 SIGN MATERIALS

A. Aluminum Sheet and Plate: ASTM B209, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.

B. Aluminum Extrusions: ASTM B221, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.

C. Acrylic Sheet: ASTM D4802, category as standard with manufacturer for each sign, Type UVF (UV filtering).

D. Paints and Coatings for Sheet Materials: Inks, dyes, and paints that are recommended by manufacturer for optimum adherence to surface and are UV and water resistant for colors and exposure indicated.

2.4 ACCESSORIES

A. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of signs, noncorrosive and compatible with each material joined, and complying with the following:

1. Use concealed fasteners and anchors unless indicated to be exposed.
2. Exposed Metal-Fastener Components, General:

    a. Fabricated from same basic metal and finish of fastened sign unless otherwise indicated.
    b. Fastener Heads: Use flathead screws and bolts with tamper-resistant Allen-head slots unless otherwise indicated.

3. Sign Mounting Fasteners:

    a. Concealed Studs: Concealed (blind), threaded studs welded or brazed to back of sign material or screwed into back of sign assembly unless otherwise indicated.
    b. Through Fasteners: Exposed metal fasteners matching sign finish, with type of head indicated, and installed in predrilled holes.

B. Adhesive: As recommended by sign manufacturer.

2.5 FABRICATION

A. General: Provide manufacturer's standard sign assemblies according to requirements indicated.

1. Preassemble signs and assemblies in the shop to greatest extent possible. Disassemble signs and assemblies only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation; apply markings in locations concealed from view after final assembly.
2. Mill joints to a tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.
3. Conceal connections if possible; otherwise, locate connections where they are inconspicuous.
4. Provide rabbets, lugs, and tabs necessary to assemble components and to attach to existing work. Drill and tap for required fasteners. Use concealed fasteners where possible; use exposed fasteners that match sign finish.

B. Signs with Changeable Message Capability: Fabricate signs to allow insertion of changeable messages as follows:

1. For snap-in changeable inserts beneath removable face sheet, furnish one suction or other device to assist in removing face sheet. Furnish initial changeable insert. Subsequent changeable inserts are by Owner.
2. For slide-in changeable inserts, fabricate slot without burrs or constrictions that inhibit function. Furnish initial changeable insert. Subsequent changeable inserts are by Owner.
3. For frame to hold changeable sign panel, fabricate frame without burrs or constrictions that inhibit function. Furnish initial sign panel. Subsequent changeable sign panels are by Owner.

2.6 GENERAL FINISH REQUIREMENTS

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.7 ALUMINUM FINISHES

A. Clear Anodic Finish: AAMA 611, Class II, 0.010 mm or thicker.

B. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of **1.5 mils**. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Install signs using mounting methods indicated and according to manufacturer's written instructions.

1. Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.
2. Install signs so they do not protrude or obstruct according to the accessibility standard.
3. Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.

B. Accessibility: Install signs in locations on walls as indicated on Drawings and according to the accessibility standard.

C. Mounting Methods:

1. Concealed Studs: Using a template, drill holes in substrate aligning with studs on back of sign. Remove loose debris from hole and substrate surface.

a. Masonry Substrates: Fill holes with adhesive. Leave recess space in hole for displaced adhesive. Place sign in position and push until flush to surface, embedding studs in holes. Temporarily support sign in position until adhesive fully sets.
b. Thin or Hollow Surfaces: Place sign in position and flush to surface, install washers and nuts on studs projecting through opposite side of surface, and tighten.

2. Through Fasteners: Drill holes in substrate using predrilled holes in sign as template. Countersink holes in sign if required. Place sign in position and flush to surface. Install through fasteners and tighten.
3. Adhesive: Clean bond-breaking materials from substrate surface and remove loose debris. Apply linear beads or spots of adhesive symmetrically to back of sign and of suitable quantity to support weight of sign after cure without slippage. Keep adhesive away from edges to prevent adhesive extrusion as sign is applied and to prevent visibility of cured adhesive at sign edges. Place sign in position, and push to engage adhesive. Temporarily support sign in position until adhesive fully sets.

3.2 ADJUSTING AND CLEANING

A. Remove and replace damaged or deformed signs and signs that do not comply with specified requirements. Replace signs with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.

B. Remove temporary protective coverings and strippable films as signs are installed.

C. On completion of installation, clean exposed surfaces of signs according to manufacturer's

written instructions, and touch up minor nicks and abrasions in finish. Maintain signs in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION 101423.16

SECTION 102800 - TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Public-use washroom accessories.
2. Private-use bathroom accessories.
3. Underlavatory guards.
4. Custodial accessories.

B. Related Requirements:

1. Section 093013 "Ceramic Tiling" for ceramic toilet and bath accessories.

1.2 ALLOWANCES

A. See Section 012100 "Allowances" for description of allowances affecting items specified in this Section.

1.3 COORDINATION

A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.

B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

1.4 ACTION SUBMITTALS

A. Product Data: For each product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
2. Include anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.

B. Delegated Design Submittals: For grab bars.

1. Include structural design calculations indicating compliance with specified structural-performance requirements.

1.5 INFORMATIONAL SUBMITTALS

A. Sample Warranty: For manufacturer's special warranties.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For accessories to include in maintenance manuals.

PART 2 - PRODUCTS

2.1 OWNER-FURNISHED MATERIALS

A. Owner-Furnished Materials: Paper Towel Dispenser and Mirrors at vanities. Contractor shall install.

2.2 PERFORMANCE 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. Structural Performance: Design accessories and fasteners to comply with the following requirements:

1. Grab Bars: Installed units are able to resist **250 lbf** concentrated load applied in any direction and at any point.

2.3 PUBLIC-USE WASHROOM ACCESSORIES

A. Source Limitations: Obtain each type of public-use washroom accessory from single source from single manufacturer.

B. Grab Bar:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Grab Bars by Bradley Corporation, Model #: 812 or comparable product by one of the following:

a. Bobrick Washroom Equipment, Inc

2. Mounting: Flanges with concealed fasteners.
3. Material: Stainless steel, **18 gauge** thick.

a. Finish: Smooth, ASTM A480/A480M No. 4 finish (satin) on ends and slip-resistant texture in grip area.

4. OD: 1-1/2 inches.

5. Configuration and Length: As indicated on Drawings.

2.4 PRIVATE-USE BATHROOM ACCESSORIES

A. Source Limitations: Obtain private-use bathroom accessories from single source from single manufacturer.

B. Private-Use Toilet Tissue Dispenser:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Surface-mounted, Single-roll, Stainless Steel Toilet Paper Dispenser, Model #: 5084 by Bradley Corporation or comparable product by one of the following:

a. Bobrick Washroom Equipment, Inc

2. Description: Single -roll dispenser with the following features:

a. Spring-positioned plastic spindle.

3. Mounting: Surface mounted.
4. Capacity: Designed for **5-1/2 inch-** diameter tissue rolls.
5. Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).

C. Private-Use Shower Curtain Rod:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Shower Curtain Rod by Bradley Corporation, Model #: 9539 or comparable product by one of the following:

a. Bobrick Washroom Equipment, Inc

2. Description: 1-1/4-inch- OD, straight rod.
3. Configuration: As indicated on Drawings.
4. Mounting Flanges: Concealed fasteners; in material and finish matching rod.
5. Rod Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).
6. Features: Integral chrome-plated brass glide hooks.

D. Private-Use Robe Hook:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Robe Hood by Bradley Corporation, Model #: 9124 or comparable product by one of the following:

a. Bobrick Washroom Equipment, Inc

2. Description: Double -prong unit.
3. Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).

E. Private-Use Towel Bar:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Round Towel Bar by Bradley Corporation, Model #: 9065 or comparable product by one of the following:

    a. Bobrick Washroom Equipment, Inc

2. Description: 3/4-inch- round tube with circular end brackets.
3. Mounting: Flanges with concealed fasteners.
4. Length: 30 inches.
5. Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).

2.5 UNDERLAVATORY GUARDS

A. Underlavatory Guard:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Handy-Shield Maxx by Plumberex Specialty Products, Inc., Model #: 2003W or comparable product by one of the following:

    a. Truebro; IPS Corporation

2. Description: Insulating pipe covering for supply and drain piping assemblies that prevents direct contact with and burns from piping; allow service access without removing coverings.
3. Material and Finish: Antimicrobial, molded plastic, white.

2.6 CUSTODIAL ACCESSORIES

A. Source Limitations: Obtain each type of custodial accessory from single source from single manufacturer.

B. Custodial Mop and Broom Holder:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Utility Shelf with 4 Hooks and 3 Holders by Bradley Corporation, Model #: 9933 or comparable product by one of the following:

    a. ASI-American Specialties, Inc.
    b. Bobrick Washroom Equipment, Inc

2. Description: Unity with shelf, hooks, and mop/broom handle holders..
3. Length: 34 inches.
4. Hooks: Four.
5. Mop/Broom Holders: Three, spring-loaded, rubber hat, cam type.
6. Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).

    a. Shelf: Not less than nominal **18-gauge** thick stainless steel.

2.7 MATERIALS

A. Stainless Steel: ASTM A240/A240M or ASTM A666, Type 304, **0.031-inch-** minimum nominal thickness unless otherwise indicated.

B. Galvanized-Steel Sheet: ASTM A653/A653M, with **G60** hot-dip zinc coating.

C. Galvanized-Steel Mounting Devices: ASTM A153/A153M, hot-dip galvanized after fabrication.

D. Fasteners: Screws, bolts, and other devices of same material as accessory unit, unless otherwise recommended by manufacturer or specified in this Section, and tamper and theft resistant where exposed, and of stainless or galvanized steel where concealed.

2.8 FABRICATION

A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.

PART 3 - EXECUTION

3.1 INSTALLATION OF TOILET, BATH, AND LAUNDRY ACCESSORIES

A. Install accessories in accordance with manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

1. Remove temporary labels and protective coatings.

B. Grab Bars: Install to comply with specified structural-performance requirements.

3.2 ADJUSTING AND CLEANING

A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.

B. Clean and polish exposed surfaces in accordance with manufacturer's written instructions.

END OF SECTION 102800

SECTION 104413 - FIRE PROTECTION CABINETS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fire-protection cabinet.

B. Related Requirements:

1. Section 104416 "Fire Extinguishers" for portable, hand-carried fire extinguishers accommodated by fire-protection cabinets.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of specified product.

1. Show door hardware, cabinet type, trim style, and panel style. Include roughing-in dimensions and details showing recessed-, semirecessed-, or surface-mounting method and relationships of box and trim to surrounding construction.

1.3 CLOSEOUT SUBMITTALS

A. Maintenance Data: For fire-protection cabinets.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain fire-protection cabinets, accessories, and fire extinguishers from single source from single manufacturer.

2.2 FIRE-PROTECTION CABINETS

A. Fire-Protection Cabinet:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Babcock-Davis
b. Croker; a Division of Morris Group International

c. Guardian Fire Equipment, Inc
d. Larsen's Manufacturing Company

2. Fire-Protection Cabinet Type: Suitable for fire extinguisher.
3. Cabinet Construction: Nonrated.
4. Cabinet Material: Cold-rolled steel sheet.

    a. Shelf: Same metal and finish as cabinet.

5. Semirecessed Cabinet:(At cavity wall) One-piece combination trim and perimeter door frame overlapping surrounding wall surface, with exposed trim face and wall return at outer edge (backbend).

    a. Rolled-Edge Trim: 2-1/2-inch backbend depth.

6. Surface-Mounted Cabinet:(At CMU wall) Cabinet box fully exposed and mounted directly on wall with no trim.
7. Cabinet Trim Material: Steel sheet.
8. Door Material: Steel sheet.
9. Door Style: Horizontal duo panel with frame.
10. Door Glazing: Tempered float glass (clear).
11. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.

    a. Provide recessed door pull and friction latch.
    b. Provide manufacturer's standard hinge, permitting door to open 180 degrees.

12. Accessories:

    a. Mounting Bracket: Manufacturer's standard steel, designed to secure fire extinguisher to fire-protection cabinet, of sizes required for types and capacities of fire extinguishers indicated, with plated or baked-enamel finish.
    b. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated.

        1) Identify fire extinguisher in fire-protection cabinet with the words " FIRE EXTINGUISHER."

13. Materials:

    a. Cold-Rolled Steel: ASTM A1008/A1008M, Commercial Steel (CS), Type B.

        1) Finish: Baked enamel, TGIC polyester powder coat, HAA polyester powder coat, epoxy powder coat, or polyester/epoxy hybrid powder coat, complying with AAMA 2603.
        2) Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
        3) Color: As selected by Architect from manufacturer's full range.

b. Tempered Float Glass: ASTM C1048, Kind FT, Condition A, Type I, Quality q3, 3 mm thick, Class 1 (clear).

2.3 FABRICATION

A. Fire-Protection Cabinets: Provide manufacturer's standard box (tub) with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated.

1. Weld joints and grind smooth.
2. Miter corners and grind smooth.
3. Provide factory-drilled mounting holes.

B. Cabinet Doors: Fabricate doors according to manufacturer's standards, from materials indicated and coordinated with cabinet types and trim styles.

1. Fabricate door frames with tubular stiles and rails and hollow-metal design, minimum 1/2 inch thick.
2. Miter and weld perimeter door frames and grind smooth.

C. Cabinet Trim: Fabricate cabinet trim in one piece with corners mitered, welded, and ground smooth.

2.4 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM AMP 500for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces of fire-protection cabinets from damage by applying a strippable, temporary protective covering before shipping.

C. Finish fire-protection cabinets after assembly.

D. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine walls and partitions for suitable framing depth and blocking where semirecessed cabinets will be installed.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare recesses for semirecessed fire-protection cabinets as required by type and size of cabinet and trim style.

3.3 INSTALLATION OF FIRE-PROTECTION CABINETS

A. General: Install fire-protection cabinets in locations and at mounting heights indicated or, if not indicated, at height indicated below:

1. Fire-Protection Cabinet Mounting Height: 42 inches above finished floor to top of fire extinguisher.

B. Fire-Protection Cabinets: Fasten cabinets to structure, square and plumb.

1. Unless otherwise indicated, provide recessed fire-protection cabinets. If wall thickness is inadequate for recessed cabinets, provide semirecessed fire-protection cabinets.
2. Fasten mounting brackets to inside surface of fire-protection cabinets, square and plumb.

C. Identification:

1. Apply vinyl lettering at locations indicated.

3.4 ADJUSTING

A. Remove temporary protective coverings and strippable films, if any, as fire-protection cabinets are installed unless otherwise indicated in manufacturer's written installation instructions.

B. Adjust fire-protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.

3.5 CLEANING

A. On completion of fire-protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.

B. Touch up marred finishes, or replace fire-protection cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by fire-protection cabinet and mounting bracket manufacturers.

C. Replace fire-protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 104413

SECTION 104416 - FIRE EXTINGUISHERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes portable, hand-carried fire extinguishers and mounting brackets for fire extinguishers.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product. Include rating and classification, material descriptions, dimensions of individual components and profiles, and finishes for fire extinguisher .

B. Product Schedule: For fire extinguishers. Coordinate final fire-extinguisher schedule with fire-protection cabinet schedule to ensure proper fit and function.

1.3 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For fire extinguishers to include in maintenance manuals.

1.4 COORDINATION

A. Coordinate type and capacity of fire extinguishers with fire-protection cabinets to ensure fit and function.

1.5 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Failure of hydrostatic test according to NFPA 10 when testing interval required by NFPA 10 is within the warranty period.
b. Faulty operation of valves or release levers.

2. Warranty Period: Six years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."

B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.

1. Provide fire extinguishers approved, listed, and labeled by FM Global.

2.2 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

A. Fire Extinguishers: Type, size, and capacity for each fire-protection cabinet indicated.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Babcock-Davis
b. Badger Fire Protection; a Carrier company
c. JL Industries; Activar Construction Products Group, Inc.
d. Larsen's Manufacturing Company

2. Valves: Manufacturer's standard.
3. Handles and Levers: Manufacturer's standard.
4. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B , and bar coding for documenting fire-extinguisher location, inspections, maintenance, and recharging.

B. Stored-Pressure Water Type to be provided in Living Room where indicated in plans: UL-rated 2-A, **2.5-gal.** nominal capacity, with water in stainless steel container; with pressure-indicating gage.

C. Wet-Chemical Type to be provided in Warming Kitchen where indicated in plans: UL-rated 2-A:1-B:C:K, 1.6-gal. nominal capacity, with potassium acetate citrate or carbonate -based chemical in stainless steel container; with pressure-indicating gage.

2.3 MOUNTING BRACKETS

A. Mounting Brackets: Manufacturer's standard galvanized steel, designed to secure fire extinguisher to wall or structure, of sizes required for types and capacities of fire extinguishers indicated, with plated or red baked-enamel finish.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Babcock-Davis
b. Badger Fire Protection; a Carrier company
c. Guardian Fire Equipment, Inc
d. JL Industries; Activar Construction Products Group, Inc.
e. Kidde; Carrier Global Corporation
f. Larsen's Manufacturing Company

B. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated by Architect.

1. Identify bracket-mounted fire extinguishers with the words "FIRE EXTINGUISHER" in red letter decals applied to mounting surface.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine fire extinguishers for proper charging and tagging.

1. Remove and replace damaged, defective, or undercharged fire extinguishers.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install fire extinguishers and mounting brackets in locations indicated and in compliance with requirements of authorities having jurisdiction.

B. Mounting Brackets: Fasten mounting brackets to surfaces, square and plumb, at locations indicated.

1. Mounting Height: Top of fire extinguisher to be at 42 inches above finished floor.

END OF SECTION 104416

SECTION 113013 - RESIDENTIAL APPLIANCES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cooking appliances.
2. Refrigeration appliances.
3. Cleaning appliances.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include installation details, material descriptions, dimensions of individual components, and finishes for each appliance.
2. Include rated capacities, operating characteristics, electrical characteristics, and furnished accessories.

B. Product Schedule: For appliances.

1.3 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of appliance.

B. Sample Warranties: For manufacturers' special warranties.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For each residential appliance to include in operation and maintenance manuals.

1.5 WARRANTY

A. Electric Cooktop and Range: Limited warranty, including parts and labor for first year and parts thereafter, for on-site service on surface-burner elements.

1. Warranty Period: One years from date of Substantial Completion.

B. Microwave Oven: Limited warranty, including parts and labor for first year and parts thereafter, for on-site service .

1. Warranty Period: One years from date of Substantial Completion.

C. Refrigerator/Freezer, Freezer, and Icemaker, Sealed System: Limited warranty, including parts and labor for first year and parts thereafter, for on-site service on the product.

1. Warranty Period for Compressor: Five years from date of Substantial Completion.
2. Warranty Period for Other Components: One years from date of Substantial Completion.

D. Dishwasher: Limited warranty, including parts and labor for first year and parts thereafter, for on-site service on the product.

1. Warranty Period: One year from date of Substantial Completion.

E. Clothes Washer: Limited warranty, including parts and labor for first year and parts thereafter, for on-site service on the product.

1. Warranty Period: One year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain each type of residential appliance from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Electrical Appliances: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.3 COOKING APPLIANCES

A. Electric Range: Slide-in range with one oven(s) and complying with AHAM ER-1.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Induction Range from GE Profile, Model PHS930YPFS with stainless steel finish or comparable product by one of the following:

    a. Bosch US; BSH Home Appliances Corporation
    b. GE Appliances; Haier Group
    c. Whirlpool Corporation

2. Width: 30 inches.
3. Electric Burner Elements: five.

    a. Induction Type: Manufacturer's standard.
    b. Controls: Digital panel controls, located on front.

4. Oven Features:

    a. Capacity: 5.3 cu. ft..
    b. Operation: convection.
    c. Broiler: Located in top of oven.
    d. Oven Door(s): Counterbalanced, removable, with observation window and full-width handle.

e. Electric Power Rating:

1) Oven(s): 2400 W.
2) Broiler: 3500 W.

f. Controls: Digital panel controls and timer display, located on front.

5. Anti-Tip Device: Manufacturer's standard.
6. Electric Power Supply: 240 V, 60 Hz, 1 phase, 30 A.
7. Material: Stainless steel with smooth surface cooktop.

a. Color/Finish: Stainless Steel.

B. Electric Wall Oven: Two-oven unit.

1. Basis-of-Design Product: Subject to compliance with requirements, provide double, wall, convection oven by GE Profile, Model #: PTD9000SNSS, with stainless steel finish or comparable product by one of the following:

a. Bosch US; BSH Home Appliances Corporation
b. GE Appliances; Haier Group
c. Whirlpool Corporation

2. Mounting: Built-in wall.
3. Capacity: 5 cu. ft., each oven.
4. Operation: convection.
5. Broiler: Located in top of oven.
6. Oven Door(s): Counterbalanced, removable, with observation window and handle.
7. Electric Power Rating:

a. Oven(s): 4300 W.
b. Broiler: 4300 W.

8. Electric Power Supply: 240 V, 60 Hz, 1 phase, 30 A.
9. Controls: Digital panel controls and timer display.
10. Material: Stainless steel.

C. Microwave Oven:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Over-the-Range Microwave with venting by GE, Model #JVM7195SKSS or comparable product by one of the following:

a. Bosch US; BSH Home Appliances Corporation
b. GE Appliances; Haier Group
c. Whirlpool Corporation

2. Mounting: Wall cabinet.
3. Type: Conventional.
4. Dimensions:

a. Width: 30 inches.
b. Depth: 15 inches.
c. Height: 16.3 inches.

5. Capacity: 1.9 cu. ft.
6. Oven Door: Door with observation window and pull handle.
7. Exhaust Fan: Four-speed fan, vented to outside and with 400 CFM capacity.
8. Microwave Power Rating: 1000 W.
9. Electric Power Supply: 120 V, 60 Hz, 1 phase, 15 A.
10. Controls: Digital panel controls and timer display.
11. Other Features: Turntable.
12. Material: Stainless steel.

2.4 REFRIGERATION APPLIANCES

A. Refrigerator/Freezer: Two-door, side-by-side refrigerator and complying with AHAM HRF-1.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Reach-in Refrigerator by Avantco, Model #: A-35R-HC, 39 1/2" width or comparable product by one of the following:

a. Bosch US; BSH Home Appliances Corporation
b. GE Appliances; Haier Group
c. Wolf; Sub-Zero Group, Inc.

2. Type: Freestanding.
3. Dimensions:

a. Width: 39 ½ inches.
b. Depth: 29 1/2 inches.
c. Height: 82 1/2 inches.

4. Storage Capacity:

a. Refrigeration Compartment Volume: 29.73 cu. ft.
b. Shelf Area: Six adjustable wire shelves, 88 lb. shelf capacity.

5. General Features:

a. Separate temperature controls for each compartment.

6. Refrigerator Features:

a. Interior light in refrigeration compartment.
b. Temperature: maintain 33 - 40 deg. F.
c. Floor of Interior Compartment: 304 stainless steel.
d. Refrigerant: R-290
e. Ozone depletion potential: 0.
f. Global warming potential: max. of 3.
g. Electrical service: 115 Volts, single-phase, 385 Watts, 4.1 Amps
h. Plug type: NEMA 5-15P.

7. Front Panel(s): Stainless steel.
8. Appliance Color/Finish: Stainless steel.

B. Freezer: Two freezer compartment(s) with door(s) and complying with AHAM HRF-1.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Solid two-door Freezer by Avantco, Model #: A-35F-HC, 39 1/2" or comparable product by one of the following:

    a. GE Appliances; Haier Group
    b. Thermador; BSH Home Appliances Corporation
    c. Whirlpool Corporation
    d. Wolf; Sub-Zero Group, Inc.

2. Type: Freestanding.
3. Dimensions:

    a. Width: 39 1/2 inches.
    b. Depth: 29 1/2 inches.
    c. Height: 82 1/2 inches.

4. Storage Capacity:

    a. Volume: 29.73 cu. ft.
    b. Shelf Area: Six adjustable wire shelves, 88 lbs. per shelf capacity.

5. Features:

    a. Automatic defrost.
    b. Interior light in compartment.
    c. Temperature controls for each compartment.
    d. Defrost drain.

6. Front Panel(s): Stainless steel.
7. Appliance Color/Finish: Stainless steel.

C. Icemaker:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Self-contained Ice Machine by Maxx Ice, Model #: MIM75 or comparable product by one of the following:

    a. GE Appliances; Haier Group
    b. Whirlpool Corporation

2. Type: Undercounter.
3. Dimensions:

    a. Width: 17.7 inches.

b. Depth: 21 inches.
c. Height: 32.7 inches.

4. Ice Capacity:

a. Production: 75 lbs per day.
b. Storage: 25 lb.

5. Features:

a. Front-breathing, air-cooled design.
b. Automatic shutoff.
c. Defrost drain.
d. Easy-to-use programmable, solid state, digital electronic control system.
e. Included: Ice Scoop.

6. Front Panel: Stainless steel.
7. Appliance Color/Finish: Stainless steel.

2.5 CLEANING APPLIANCES

A. Dishwasher: Complying with AHAM DW-1.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Under-counter Dishwasher by GE Profile, Model #PDT795SYVFS or comparable product by one of the following:

a. Bosch US; BSH Home Appliances Corporation
b. GE Appliances; Haier Group
c. Whirlpool Corporation

2. Type: Built-in undercounter.
3. Dimensions:

a. Width: 24 inches.
b. Depth: 25-3/4 inches.
c. Height: 34-1/2 inches.

4. Capacity:

a. International Place Settings of China: 16.

5. Sound Level: Maximum 40 dB.
6. Tub and Door Liner: Stainless steel with sealed detergent and automatic rinsing-aid dispensers.
7. Rack System: Nylon-coated sliding dish racks, with removable cutlery basket top cutlery tray.
8. Controls: Touch-pad controls with four wash cycles and hot-air and heat-off drying cycle options.

9. Features:

    a. Waste food disposer.
    b. Self-cleaning food-filter system.
    c. Hot-water booster heater for 160 deg F wash water with incoming water at **100 deg F**.
    d. Lock-out feature.
    e. Half-load option.
    f. Delay-wash option.
    g. Digital display panel.
    h. Water softener.
    i. Soil-sensing water use control system.

10. Front Panel: Stainless steel.
11. Appliance Color/Finish: Stainless steel.

B. Clothes Washer/Dryer Combination: Complying with AHAM HLW-1.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Stacked Washer/Dryer by GE Appliances, Model #: GUD27ESSMWW or comparable product by one of the following:

    a. LG Electronics USA, Inc.; LG Electronics Inc.
    b. Whirlpool Corporation
    c. Speed Queen

2. Type: Freestanding washer/dryer unit with dual-drum design and electric dryer; washer is **front** loading.
3. Dimensions:

    a. Width: 27 inches.
    b. Depth: 32 inches.
    c. Height: 76 inches.

4. Washer and Dryer Drums: Perforated stainless steel.

    a. Washer-Drum Capacity: 3.8 cu. ft.
    b. Dryer-Drum Capacity: 5.9 cu. ft..

5. Washer Controls: Rotary-dial controls for water-fill levels, wash/rinse water temperatures, and variable-speed and fabric selectors.
6. Dryer Controls: Rotary-dial controls for drying cycle, temperatures, and fabric selectors.

    a. Wash Cycles: Eleven wash cycles, including regular, delicate, and permanent press.
    b. Wash Temperatures: Six settings.

7. Electric Washer/Dryer Power: 240 V, 60 Hz, 1 phase, 30 A.
8. Motor: Manufacturer's standard with built-in overload protector.
9. Washing Features:

a. Self-cleaning lint filter.
b. Unbalanced-load compensator.
c. Inlet Hoses: Minimum length **60 inches**.
d. Drain Hoses: Minimum length **48 inches**.
e. Self-leveling legs.
f. Automatic dispenser for bleach and detergent.
g. Spin-cycle safety switch.

10. Drying Features:

    a. Removable lint filter.
    b. Electronic temperature and moisture-level-sensor controls.
    c. End-of-cycle signal.
    d. Interior drum light.

11. Appliance Finish: Enamel.

    a. Color: As selected by Architect from manufacturer's full range.

2.6 GENERAL FINISH REQUIREMENTS

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, power connections, and other conditions affecting installation and performance of residential appliances.

B. Examine roughing-in for piping systems to verify actual locations of piping connections before appliance installation.

C. Examine walls, ceilings, and roofs for suitable conditions where microwave ovens with vented exhaust fans will be installed.

D. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF RESIDENTIAL APPLIANCES

A. Install appliances according to manufacturer's written instructions.

B. Built-in Equipment: Securely anchor units to supporting cabinets or countertops with concealed fasteners. Verify that clearances are adequate for proper functioning and that rough openings are completely concealed.

C. Freestanding Equipment: Place units in final locations after finishes have been completed in each area. Verify that clearances are adequate to properly operate equipment.

D. Range Anti-Tip Device: Install at each range according to manufacturer's written instructions.

3.3 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

1. Perform visual, mechanical, and electrical inspection and testing for each appliance according to manufacturers' written recommendations. Certify compliance with each manufacturer's appliance-performance parameters.
2. Leak Test: After installation, test for leaks. Repair leaks and retest until no leaks exist.
3. Operational Test: After installation, start units to confirm proper operation.
4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and components.

B. An appliance will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

END OF SECTION 113013

SECTION 123530 - RESIDENTIAL CASEWORK

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Residential stock cabinets.

B. Related Requirements:

1. Section 061000 "Rough Carpentry" for wood blocking for anchoring casework.
2. Section 123623.13 "Plastic-Laminate-Clad Countertops."
3. Section 123640 "Stone Countertops."
4. Section 123661 "Simulated Stone Countertops."

1.2 DEFINITIONS

A. Concealed Surfaces of Casework: Surfaces not usually visible after installation, including sleepers, web frames, dust panels, bottoms of drawers, and ends of casework installed directly against and completely concealed by walls or other casework, and tops of wall cabinets and utility cabinets.

B. Exposed Surfaces of Casework: Surfaces visible when doors and drawers are closed, including visible surfaces in open cabinets or behind glass doors.

C. Semiexposed Surfaces of Casework: Surfaces behind opaque doors or drawer fronts, including interior faces of doors, interiors and sides of drawers, and bottoms of wall cabinets.

1.3 COORDINATION

A. Coordinate layout and installation of blocking and reinforcement in partitions for support of casework.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components, and profiles and finishes for casework.
2. Include rated capacities, operating characteristics, profiles, and finishes for hardware.

B. Shop Drawings:

1. Include plans, elevations, details, and attachments to other work.
2. Show materials, finishes, filler panels, and hardware.

C. Samples: For casework and hardware finishes.

D. Samples for Initial Selection: For casework and hardware finishes.

E. Samples for Verification: For the following:

1. Casework Finishes: 8-by-10-inch Samples for each type of casework finish.
2. Hardware: One full-size Sample of each type of exposed hardware in each finish required.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer.

B. Product Certificates: For casework.

1.6 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install casework until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.

B. Established Dimensions: Where casework is indicated to fit to other construction, establish dimensions for areas where casework is to fit. Coordinate construction to ensure that actual dimensions correspond to established dimensions. Provide fillers and scribes to allow for trimming and fitting.

C. Field Measurements: Where casework is indicated to fit to other construction, verify dimensions of existing construction by field measurements before fabrication and indicate measurements on Shop Drawings. Provide fillers and scribes to allow for trimming and fitting.

1. Locate concealed framing, blocking, and reinforcements that support casework by field measurements before being enclosed/concealed by construction, and indicate measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 RESIDENTIAL STOCK CABINETS

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. Cabinetworks Group
2. MasterBrand Cabinets, Inc.
3. Wellborn Forest Products, Inc

B. Quality Standard: Provide cabinets that comply with KCMA A161.1.

1. KCMA Certification: Provide cabinets with KCMA's "Certified Cabinet" seal affixed in a semiexposed location of each unit and showing compliance with KCMA A161.1.

C. Door and Drawer Face Style: Flush overlay; faces cover cabinet fronts.

1. Door and Drawer Fronts:

a. Solid-wood stiles and rails, **5/8 inch** thick, with **1/2-inch-** thick, solid-wood center panels.

D. Cabinet Style: Face frame.

1. Face Frames:

a. **3/4-by-1-5/8-inch** solid wood with glued mortise and tenon or doweled joints.

E. Exposed Cabinet End Finish: Wood veneer.

2.2 CABINET MATERIALS

A. Hardwood Lumber: Kiln dried to 7 percent moisture content.

B. Softwood Lumber: Kiln dried to 10 percent moisture content.

1. Hardwood Plywood: 0.05 ppm.
2. Particleboard: 0.09 ppm.
3. MDF More Than 5/16 Inch (8 mm) Thick: 0.11 ppm.
4. MDF 5/16 Inch (8 mm) or Less in Thickness: 0.13 ppm.

C. Hardwood Plywood: HPVA HP-1.

D. Particleboard: ANSI A208.1, Grade M-2.

E. MDF: Medium-density fiberboard, ANSI A208.2, Grade MD.

F. Hardboard: ANSI A135.4, Class 1 tempered.

G. Exposed Materials:

1. Exposed Wood Species: Manufacturer's standard domestic hardwood species.

a. Select materials for compatible color and grain. Do not use two adjacent exposed surfaces that are noticeably dissimilar in color, grain, figure, or natural character

markings.

b. Staining and Finish: As selected by Architect from manufacturer's full range.

2. Solid Wood: Clear hardwood lumber of species indicated, free of defects.
3. Plywood: Hardwood plywood with face veneer of species indicated, with Grade A faces and Grade C backs of same species as faces.

a. Edge band exposed edges with veneer edging of same species as face veneer.

H. Semiexposed Materials: Unless otherwise indicated, provide the following:

1. Solid Wood: Sound hardwood lumber, selected to eliminate appearance defects. Same species as exposed surfaces or stained to be compatible with exposed surfaces.
2. Plywood: Hardwood plywood with Grade C faces and not less than Grade 3 backs of same species as faces. Face veneers of same species as exposed surfaces .

I. Concealed Materials: Solid wood or plywood, of any hardwood or softwood species, with no defects affecting strength or utility; particleboard; MDF; or hardboard.

2.3 CABINET HARDWARE

A. General: Manufacturer's standard units complying with BHMA A156.9, of type, size, style, material, and finish as selected by Architect from manufacturer's full range.

B. Pulls: Back-mounted decorative pulls.

C. Hinges: Concealed European-style, self-closing hinges.

D. Drawer Guides: Epoxy-coated-metal, self-closing drawer guides; designed to prevent rebound when drawers are closed; with nylon-tired, ball-bearing rollers; and complying with BHMA A156.9, Type B05011 or Type B05091.

E. Door and Drawer Bumpers: Self-adhering, clear silicone rubber.

1. Doors: Provide one bumper at top and bottom of closing edge of each swinging door.
2. Drawers: Provide one bumper on back side of drawer front at each corner.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances, location of framing and reinforcements, and other conditions affecting performance of casework.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF RESIDENTIAL CASEWORK

A. Install casework with no variations in adjoining surfaces; use concealed shims. Where casework abuts other finished work, scribe and cut for accurate fit. Provide filler strips, scribe strips, and moldings in finish to match casework.

B. Install casework without distortion so doors and drawers fit the openings, are aligned, and are uniformly spaced. Complete installation of hardware and accessories as indicated.

C. Install casework level and plumb to a tolerance of 1/8 inch in 8 ft..

D. Fasten casework to adjacent units and to backing.

1. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches o.c.

a. Fasteners: No. 10 wafer-head screws sized for not less than 1-1/2-inch penetration into wood framing, blocking, or hanging strips.

3.3 ADJUSTING AND CLEANING

A. Adjust hardware so doors and drawers are centered in openings and operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer.

B. Clean casework on exposed and semiexposed surfaces. Touch up as required to restore damaged or soiled areas to match original factory finish, as approved by Architect.

END OF SECTION 123530

SECTION 123623.13 - PLASTIC-LAMINATE-CLAD COUNTERTOPS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Plastic-laminate-clad countertops.

B. Related Requirements:

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include data for fire-retardant treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.

B. Shop Drawings:

1. Plans, sections, details, edge and backsplash profiles, and attachments to other work.
2. Locations and details of joints.
3. Locations and sizes of cutouts and holes for items installed in countertop.

C. Samples for Initial Selection: Plastic laminates in each type, color, pattern, and surface finish required in manufacturer's standard size.

D. Samples for Verification:

1. Plastic Laminates: For each type, color, pattern, and surface finish required, 8 by 10 inches in size.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Deliver countertops only after casework and supports on which they will be installed have been completed in installation areas.

B. Store countertops in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

C. Keep surfaces of countertops covered with protective covering during handling and installation.

1.4 FIELD CONDITIONS

A. Environmental Limitations with Humidity Control: Do not deliver or install countertops until

building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature between **60 and 90 deg F** and relative humidity between 43 and 70 percent during the remainder of the construction period.

B. Field Measurements: Where countertops are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

PART 2 - PRODUCTS

2.1 PLASTIC-LAMINATE-CLAD COUNTERTOPS

A. Plastic-Laminate-Clad Countertop Type in Kitchen and Restrooms:

B. Grade: Custom.

C. High-Pressure Decorative Laminate: ISO 4586-3, Grade HGS.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. ABET Inc.
b. Formica Corporation
c. Laminart LLC
d. Nevamar Company, LLC
e. Pionite; a Panolam Industries International, Inc. brand
f. Wilsonart LLC

D. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:

1. As selected by Architect from manufacturer's full range in the following categories:

a. Patterns, gloss finish.

E. Edge Treatment: Same as laminate cladding on horizontal surfaces.

F. Core Material: Veneer-core plywood.

G. Core Material at Sinks: veneer-core plywood made with Type II adhesive.

H. Core Thickness: 3/4 inch.

1. Build up countertop thickness to **1-1/2 inches** at front, back, and ends with additional layers of core material laminated to top.
2. Provide drip groove 1/8 by 1/8 inch set back 3/8 inch from front edge of countertop.

2.2 WOOD MATERIALS

A. Wood Products: Provide materials that comply with requirements of referenced quality

standard unless otherwise indicated.

B. Composite Panel Products: Provide materials that comply with requirements of referenced quality standard for each type of countertop and quality grade specified unless otherwise indicated.

a. Hardwood Plywood: 0.05 ppm.
b. Particleboard: 0.09 ppm.
c. MDF More Than 5/16 Inch (8 mm) Thick: 0.11 ppm.
d. MDF 5/16 Inch (8 mm) or Less in Thickness: 0.13 ppm.

2. Veneer-Core Hardwood Plywood: ANSI/HPVA HP-1.

C. Support Brackets:

1. Countertop: Where countertop overhang is greater than 6 inches.

a. Type: **Hidden**.
b. Material: **Steel**.
c. Color: **Black** powder coat.

2.3 MISCELLANEOUS MATERIALS

A. Adhesive for Bonding Plastic Laminate: Type I, waterproof type as selected by fabricator to comply with requirements.

B. Installation Adhesive: Manufacturer's standard product that is recommended for application indicated.

2.4 FABRICATION

A. Fabricate countertops to dimensions, profiles, and details indicated. Provide front and end overhang of **1 inch** over base cabinets. Ease edges to radius indicated for the following:

1. Solid-Wood (Lumber) Members: **1/16 inch** unless otherwise indicated.

B. Complete fabrication, including assembly, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

C. Shop cut openings to maximum extent possible to receive appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately, and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

1. Seal edges of cutouts by saturating with varnish.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates to receive countertops and conditions under which countertops will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of countertops.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Before installation, condition countertops to average prevailing humidity conditions in installation areas.

B. Examine shop-fabricated work for completion and complete work as required, including removal of packing.

3.3 INSTALLATION OF PLASTIC-LAMINATE-CLAD COUNTERTOPS

A. Grade: Install countertops to comply with same grade as item to be installed.

B. Assemble countertops and complete fabrication at Project site to extent that it was not completed in the shop.

1. Provide cutouts for appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately, and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
2. Seal edges of cutouts by saturating with varnish.

C. Field Jointing: Where possible, make in the same manner as shop jointing, using dowels, splines, adhesives, and fasteners recommended by manufacturer. Prepare edges to be joined in shop so Project-site processing of top and edge surfaces is not required. Locate field joints where indicated on Shop Drawings.

1. Secure field joints in countertops with concealed clamping devices located within **6 inches** of front and back edges and at intervals not exceeding **24 inches**. Tighten in accordance with manufacturer's written instructions to exert a constant, heavy-clamping pressure at joints.

D. Countertop Installation:

1. Scribe and cut countertops to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
2. Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.

3. Anchor wall cleating necessary for proper setting for countertops not supported by casework.
4. Install countertops level and true in line. Use concealed shims as required to maintain not more than **1/8-inch-in-96-inch** variation from a straight, level plane.
5. Secure backsplashes to walls with adhesive.
6. Seal joints between countertop and backsplash, if any, and joints where countertop and backsplash abut walls with mildew-resistant silicone sealant or another permanently elastic sealing compound recommended by countertop material manufacturer.

3.4 ADJUSTING AND CLEANING

A. Repair damaged and defective countertops, where possible, to eliminate functional and visual defects. Where impossible to repair, replace countertops. Adjust joinery for uniform appearance.

B. Clean countertops on exposed and semiexposed surfaces.

C. Protection: Provide kraft paper or other suitable covering over countertop surfaces, taped to underside of countertop at a minimum of **48 inches** o.c. Remove protection at Substantial Completion.

END OF SECTION 123623.13

SECTION 123640 - STONE COUNTERTOPS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Granite countertops.

B. Related Requirements:

1. Section 123661 "Simulated Stone Countertops" for cultured-marble and quartz-agglomerate countertops.

1.2 ACTION SUBMITTALS

A. Product Data:

1. For each variety of stone, and stone accessory product.

B. Shop Drawings:

1. Plans, sections, details, edge and backsplash profiles, and attachments to other work.
2. Locations and details of joints.
3. Direction of veining, grain, or other directional pattern.
4. Locations and sizes of cutouts and holes for items installed in countertop.
5. Apply AWI's Quality Certification Program label to Shop Drawings.

C. Samples: For each stone type, in sets not less than **12 inches** square.

1. Include two or more Samples in each set and show the full range of variations in appearance characteristics expected in the completed Work.

1.3 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Indicate locations and sizes of cutouts and holes for items installed in countertop and backsplashes.

B. Material Test Reports:

1. Stone Test Reports: For each stone variety proposed for use on Project, by a qualified testing agency, indicating compliance with required physical properties, in accordance with referenced ASTM standards. Base reports on testing done within previous five years.

2. Sealant Compatibility and Adhesion Test Report: From sealant manufacturer indicating that sealants will not stain or damage stone.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For stone countertops. Include product data for stone-care products used or recommended by Installer, and names, addresses, and telephone numbers of local sources for products.

1.5 FIELD CONDITIONS

A. Field Measurements: Verify dimensions of construction to receive stone countertops by field measurements before fabrication .

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Stone: Obtain each variety of stone, regardless of finish, from a single quarry , whether specified in this Section or in another Specification Section, with resources to provide materials of consistent quality in appearance and physical properties.

1. Make stone slabs available for examination by Architect.

a. Architect will select aesthetically acceptable slabs .
b. Segregate slabs selected for use on Project and mark backs indicating approval.

2.2 PERFORMANCE REQUIREMENTS

A. General: Comply with recommendations in NSI's "Dimension Stone Design Manual."

B. Select stone for intended use to prevent fabricated units from containing cracks, seams, and starts that may impair structural integrity, function, or appearance.

1. Repairs that are characteristic of the varieties specified are acceptable provided they do not impair structural integrity or function and are not aesthetically unpleasing, as judged by Architect.

C. Quality Standard: Unless otherwise indicated, comply with ANSI/AWI 1236 for grades of stone countertops indicated for construction, finishes, installation, and other requirements.

1. Grade: Custom.

2.3 GRANITE COUNTERTOPS

A. Material Standard: Comply with ASTM C615/C615M.

B. Granite Countertop Type to be selected by Architect, see Section 012100 "Allowances" for granite countertop allowance and Section 012300 "Alternates" for granite countertop allowance:

1. Description:

a. Nominal Thickness: Provide thickness indicated, but not less than 1-1/4 inches or 3 cm. Gage backs to provide units of identical thickness.
b. Edge Profile: Full bullnose.
c. Splashes: Provide 3/4-inch- or 2 cm thick backsplashes and end splashes unless otherwise indicated.

1) Height: 4 inches.
2) Top-Edge Profile: Radius.

2.4 ACCESSORIES

A. Support Brackets:

1. Countertop: Granite:

a. Type: Hidden.
b. Material: Steel.
c. Color: Black powder coat.

2.5 MISCELLANEOUS MATERIALS

A. General: Use only adhesives formulated for stone and ceramic tile and that are recommended by their manufacturer for the application indicated.

B. Stone Adhesive: Epoxy or polyester formulated specifically for bonding or seaming stone to stone, with an initial set time of not more than two hours at 70 deg F.

1. Color: Clear.

C. Sealant for Countertops: Manufacturer's standard sealant that complies with applicable requirements in Section 079200 "Joint Sealants" and that will not stain the stone it is applied to.

1. Joint Sealant: Latex.
2. Color: Clear.

D. Stone Cleaner: Specifically formulated for stone types, finishes, and applications indicated, as recommended by stone producer and, if a sealer is specified, by sealer manufacturer. Do not

use cleaning compounds containing acids, caustics, harsh fillers, or abrasives.

E. Stone Sealer: Stone manufacturer's recommended colorless, stain-resistant sealer that does not affect color or physical properties of stone surfaces, as recommended by stone producer for application indicated.

2.6 FABRICATION

A. Fabricate stone countertops in sizes and shapes required to comply with requirements indicated.

1. Clean sawed backs of stones to remove rust stains and iron particles.
2. Dress joints straight and at right angle to face unless otherwise indicated.
3. Cut and drill sinkages and holes in stone for anchors, supports, and attachments.
4. Provide openings, reveals, and similar features as needed to accommodate adjacent work.
5. Fabricate molded edges with machines having abrasive shaping wheels made to reverse contour of edge profile to produce uniform shape throughout entire length of edge and with precisely formed arris slightly eased to prevent snipping, and matched at joints between units. Form corners of molded edges as indicated with outside corners slightly eased unless otherwise indicated.
6. Finish exposed faces of stone to comply with requirements indicated for finish of each stone type required and to match approved Samples and mockups. Provide matching finish on exposed edges of countertops, splashes, and cutouts.

B. Mark stone for final locations to produce assembled countertop units with an overall uniform appearance.

C. Carefully inspect finished stone units at fabrication plant for compliance with requirements for appearance, material, and fabrication. Replace defective units.

D. Joints:

1. Fabricate countertops in sections for joining in field .
2. Joint Locations: Not within **18 inches** of a sink or cooktop and not where a countertop section less than **36 inches** long may result, unless unavoidable.
3. Joint Type, Bonded or Seamed: **1/32 inch** or less in width.

E. Cutouts and Holes:

1. Counter-Mounted Fixtures: Prepare countertops in shop for field cutting openings for counter-mounted fixtures. Mark tops for cutouts and drill holes at corners of cutout locations. Make corner holes of largest radius practical.
2. Fittings: Drill countertops in shop for plumbing fittings, undercounter soap dispensers, and similar items.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates to receive stone countertops and conditions under which stone countertops will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of stone countertops.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Advise installers of other work about specific requirements for placement of inserts and similar items to be used by stone countertop Installer for anchoring stone countertops. Furnish installers of other work with Drawings or templates showing locations of these items.

B. Clean dirty or stained stone surfaces by removing soil, stains, and foreign materials. Use only mild cleaning compounds that contain no caustic or harsh materials or abrasives, and rinse with clear water. Allow stone to dry before installing.

3.3 INSTALLATION OF STONE COUNTERTOPS

A. Grade: Install countertop to comply with same grade as item to be installed.

B. Install countertops by adhering to supports with water-cleanable epoxy adhesive.

C. Do necessary field cutting as stone is set. Use power saws with diamond blades to cut stone. Cut lines straight, true, and at right angles to finished surfaces unless beveling is required for clearance. Ease edges slightly to prevent snipping.

D. Set stone to comply with requirements indicated. Shim and adjust stone to locations indicated, with uniform joints of widths indicated and with edges and faces aligned according to established relationships and indicated tolerances. Install anchors and other attachments indicated or necessary to secure stone countertops in place.

E. Bond joints with stone adhesive and draw tight as countertops are set. Mask areas of countertops adjacent to joints to prevent adhesive smears.

1. Clamp units to temporary bracing, supports, or each other to ensure that countertops are properly aligned and joints are of specified width.

F. Complete cutouts not finished in shop. Mask areas of countertops adjacent to cutouts to prevent damage while cutting. Use power saws with diamond blades to cut stone. Make cutouts to accurately fit items to be installed, and at right angles to finished surfaces unless beveling is required for clearance. Ease edges slightly to prevent snipping.

G. Install backsplashes and end splashes by adhering to wall with water-cleanable epoxy

adhesive. Leave 1/16-inch gap between countertop and splashes for filling with sealant. Use temporary shims to ensure uniform spacing.

H. Grout joints to comply with ANSI A108.10. Remove temporary shims before grouting. Tool grout uniformly and smoothly with plastic tool.

I. Apply sealant to gaps specified for filling with sealant; comply with Section 079200 "Joint Sealants." Remove temporary shims before applying sealant.

3.4 REPAIR

A. Repair damaged and defective countertop where possible, to eliminate functional and visual defects and to result in interior architectural woodwork being in compliance with requirements of referenced quality standard for the specified grade.

B. Where not possible to repair, remove and replace stone countertops of the following description:

1. Broken, chipped, stained, or otherwise damaged stone. Stone may be repaired if methods and results are approved by Architect.
2. Defective countertops.
3. Defective joints, including misaligned joints.
4. Interior stone countertops and joints not matching approved Samples and mockups.
5. Interior stone countertops not complying with other requirements indicated.

C. Replace in a manner that results in stone countertops matching approved Samples and mockups, complying with other requirements, and showing no evidence of replacement.

3.5 ADJUSTING AND CLEANING

A. In-Progress Cleaning: Clean countertops as work progresses. Remove adhesive, grout, mortar, and sealant smears immediately.

B. Clean stone countertops no fewer than six days after completion of sealant installation, using clean water and soft rags. Do not use wire brushes, acid-type cleaning agents, cleaning compounds with caustic or harsh fillers, or other materials or methods that may damage stone.

C. Sealer Application: Apply stone sealer to comply with stone producer's and sealer manufacturer's written instructions.

END OF SECTION 123640

SECTION 123661 - SIMULATED STONE COUNTERTOPS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Quartz agglomerate countertops.

B. Related Requirements:

1. Section 224200 "Commercial Plumbing Fixtures" for non-integral sinks and plumbing fittings.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of countertop material .

B. Shop Drawings:

1. Plans, sections, details, edge and backsplash profiles, and attachment to other work.
2. Locations and details of joints.
3. Locations, quantity, and type of supports/brackets.
4. Direction of directional pattern, if any.
5. Locations and sizes of cutouts and holes for items installed in countertop.

C. Samples for Initial Selection: For each type of material exposed to view.

D. Samples for Verification:

1. Countertop material, 6 inches square.

1.3 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Indicate locations and sizes of cutouts and holes for items installed in countertops or backsplashes.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For solid surface material countertops to include in maintenance manuals. Include product data for care products used or recommended by Installer and names, addresses, and telephone numbers of local sources for products.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver countertops only after casework and supports on which they will be installed have been completed in installation areas.

B. Store countertops in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

C. Keep surfaces of countertops covered with protective covering during handling and installation.

1.6 FIELD CONDITIONS

A. Field Measurements: Where countertops are indicated to fit to other construction, verify dimensions of countertops by field measurements after base cabinets are installed but before countertop fabrication is complete and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work..

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Quality Standard: Unless otherwise indicated, comply with ANSI/AWI 1236 for grades of simulated stone countertops indicated for construction, finishes, installation, and other requirements.

1. The Contract Documents contain more stringent requirements than that of the referenced quality standard. Comply with requirements of the Contract Documents in addition to those of referenced quality standard.

2.2 QUARTZ AGGLOMERATE COUNTERTOPS

A. Quartz Agglomerate Countertop Type Quartz:

1. Grade: Custom.

B. Quartz Agglomerate Material: Homogenous fabrication of natural quartz aggregates and pigments bound together with a matrix of polymers and resins, complying with ISFA 3-01.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Cambria
b. Ceasarstone
c. LX Viatera
d. Silestone

2. Colors and Patterns: As selected by Architect from manufacturer's full range.
3. Countertop:

    a. Thickness: 1.18 inch.
    b. Exposed Edge Treatment: Eased.
    c. Provide drip groove 1/8 inch by 1/8 inch set back 3/8 inch from front edge of countertop.
    d. Backsplash: Integral coved.

        1) Height: 4 inches.

    e. End Splash: Matching backsplash.

2.3 ACCESSORIES

A. Support Brackets:

1. Countertop <**Quartz**>:

    a. Type: Hidden.
    b. Material: Steel.
    c. Color: Black powder coat.

2.4 FABRICATION

A. Fabricate countertops in sizes and shapes required to comply with requirements indicated.

B. Fabricate tops with shop-applied edges and backsplashes unless otherwise indicated. Comply with solid surface material manufacturer's written instructions for adhesives, sealers, fabrication, and finishing.

C. Joints:

1. Fabricate countertops in sections for joining in field .

    a. Joint Locations: Not within **18 inches** of a sink or cooktop and not where a countertop section less than **36 inches** long would result, unless unavoidable.

D. Cutouts and Holes:

1. Counter-Mounted Plumbing Fixtures: Prepare countertops in shop for field cutting openings for counter-mounted fixtures. Mark tops for cutouts and drill holes at corners of cutout locations. Make corner holes of largest radius practical.
2. Fittings: Drill countertops in shop for grommets, plumbing fittings, undercounter soap dispensers, and similar items.
3. Counter-Mounted Cooktops: Prepare countertops in shop for field cutting openings for cooktops. Mark tops for cutouts and drill holes at corners of cutout locations. Make corner holes of largest radius practical.

2.5 INSTALLATION MATERIALS

A. Plywood: Exterior softwood plywood complying with DOC PS 1, Grade C-C Plugged, touch sanded.

B. Adhesive: Product recommended by manufacturer.

C. Sealant for Countertops: Comply with applicable requirements in Section 079200 "Joint Sealants."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates to receive countertops and conditions under which countertops will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of countertops.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Before installation, condition countertops to average prevailing humidity conditions in installation areas.

B. Examine shop-fabricated work for completion and complete work as required, including removal of packing.

3.3 INSTALLATION OF SIMULATED STONE COUNTERTOPS

A. Grade: Install countertops to comply with specified grade.

B. Assemble countertops and complete fabrication at Project site to the extent that it was not completed in the shop.

1. Provide cutouts not finished in the shop. Make cutouts to accurately fit items to be installed, and at right angles to finished surfaces unless beveling is required for clearance. Ease edges slightly to prevent snipping.

C. Countertop Installation:

1. Scribe and cut countertops to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
2. Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.
3. Anchor wall cleating necessary for proper setting for countertops not supported by

casework.

4. Install countertops level to a tolerance of 1/8 inch in 8 ft., 1/4 inch maximum. Do not exceed 1/64-inch difference between planes of adjacent units.
5. Fasten subtops to cabinets by screwing through subtops into cornerblocks of base cabinets. Shim as needed to align subtops in a level plane.
6. Secure countertops to subtops with adhesive according to manufacturer's written instructions. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with quartz agglomerate manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
7. Bond joints with adhesive and draw tight as countertops are set. Mask areas of countertops adjacent to joints to prevent adhesive smears.

    a. Clamp units to temporary bracing, supports, or each other to ensure that countertops are properly aligned and joints are of specified width.

8. Install bend splashes by adhering to wall and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears.
9. Install aprons to backing and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears. Fasten by screwing through backing. Predrill holes for screws as recommended by manufacturer.
10. Seal joints between countertop and backsplash, if any, and joints where countertop and backsplash abut walls. Comply with Section 079200 "Joint Sealants."

3.4 ADJUSTING AND CLEANING

A. Repair damaged and defective countertops, where possible, to eliminate functional and visual defects. Where not possible to repair, replace countertops. Adjust joinery for uniform appearance.

B. Clean countertops on exposed and semi-exposed surfaces.

C. Protection: Provide Kraft paper or other suitable covering over countertop surfaces, taped to underside of countertop at a minimum of 48 inches o.c. Remove protection at Substantial Completion.

END OF SECTION 123661

SECTION 313116 - TERMITE CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Bait-station system.

B. Related Requirements:

1. Section 076200 "Sheet Metal Flashing and Trim" for custom-fabricated, metal termite shields.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components, and profiles for termite control products.
2. Include the EPA-Registered Label for termiticide products.

1.3 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of termite control product.

B. Bait-Station System Installation Report: After installation of bait-station system is completed, submit report for Owner's records and include the following:

1. Location of areas and sites conducive to termite feeding and activity.
2. Plan drawing showing number and locations of bait stations.
3. Dated report for each monitoring and inspection occurrence, indicating level of termite activity, procedure, and treatment applied before time of Substantial Completion.
4. Termiticide brand name and manufacturer.
5. Schedule of inspections for one year from date of Substantial Completion.

C. Sample Warranties: For special warranties.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: A specialist who is licensed according to regulations of authorities having jurisdiction to apply termite control treatment and products in jurisdiction where Project is located and who employs workers trained and approved by manufacturer to install

manufacturer's products.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain termite control products from single source from single manufacturer.

2.2 BAIT-STATION SYSTEM

A. Bait-Station System: EPA-Registered system acceptable to authorities having jurisdiction. Provide bait stations based on the dimensions of building perimeter indicated on Drawings, according to product's EPA-Registered Label and manufacturer's written instructions.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Sentricon termite control system by Corteva Agriscience or

a. Ensystex, Inc
b. The Dow Chemical Company

PART 3 - EXECUTION

3.1 PREPARATION

A. General: Prepare work areas according to the requirements of authorities having jurisdiction and according to manufacturer's written instructions before beginning application and installation of termite control treatment(s). Remove extraneous sources of wood cellulose and other edible materials, such as wood debris, tree stumps and roots, stakes, formwork, and construction waste wood from soil within and around foundations.

B. Prior to beginning construction activity, the termite control company shall inspect the existing building for termite activity. Notify Architect of any existing termite activity and proposed remediation.

3.2 INSTALLING BAIT-STATION SYSTEM

A. Bait-Station System: Install after construction, including landscaping, is completed.

B. Place bait stations according to product's EPA-Registered Label and manufacturer's written instructions, in the following locations:

1. In locations where recommended by manufacturer to control termites in the entire building including Addition, Renovation area, and Unrenovated existing building as well as Patio.

C. Spacing: Place bait stations according to manufacturer's written instructions and at a frequency no less than the following:

1. One bait station per 20 linear feet.

3.3 MAINTENANCE SERVICE

A. Continuing Maintenance Proposal: Provide from termite-control-treatment Installer to Owner, in the form of a standard yearly (or other period) maintenance agreement, starting on date initial maintenance service is concluded. State services, obligations, conditions, and terms for agreement period and for future renewal options.

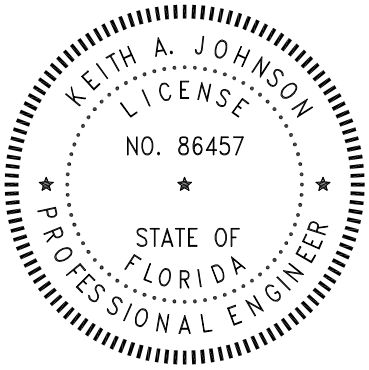
1. Include annual inspection for termite activity and effectiveness of termite treatment according to manufacturer's written instructions.

END OF SECTION 313116

TABLE OF CONTENTS

DIVISION 15 – MECHANICAL

15005	MECHANICAL GENERAL
15020	CODES AND STANDARDS
15030	MECHANICAL RELATED WORK
15105	PIPES AND PIPE FITTINGS
15110	VALVES
15120	PIPING SPECIALTIES
15135	VIBRATION ISOLATION
15150	SUPPORTS, ANCHORS, AND SEALS
15160	MECHANICAL IDENTIFICATION
15170	ACCESS DOORS
15180	TESTING, CLEANING, AND STERILIZATION OF PIPING SYSTEMS
15190	EXCAVATION AND BACKFILL
15205	INSULATION FOR PLUMBING PIPE AND EQUIPMENT
15210	INSULATION FOR HVAC EQUIPMENT AND PIPING
15230	EXTERIOR INSULATION FOR DUCTWORK
15405	POTABLE WATER SYSTEM
15410	SOIL, WASTE, AND VENT SYSTEM
15430	PLUMBING FIXTURES, EQUIPMENT, TRIM & SCHEDULE
15440	GAS SYSTEM
15710	SPLIT SYSTEM AIR CONDITIONING UNITS
15810	FANS
15840	HVAC METAL DUCTWORK
15855	DUCTWORK ACCESSORIES



15860 GRILLES, REGISTERS, AND CEILING DIFFUSERS

15875 WALL LOUVERS

15887 BI POLAR IONIZATION AIR CLEANING EQUIPMENT

15970 START-UP REQUIREMENTS FOR HVAC SYSTEMS

15985 TESTING AND BALANCING OF MECHANICAL SYSTEMS

DIVISION 16 – ELECTRICAL

16000 ELECTRICAL GENERAL REQUIREMENTS

16100 LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS, CABLES, & DEVICES

16200 RACEWAY SYSTEMS

16300 SERVICE & DISTRIBUTION

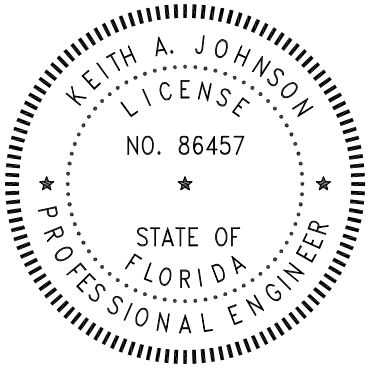
16400 BASIC ELECTRICAL MATERIALS & METHODS

16500 INTERIOR LIGHTING

16612 GENSET

16613 MTS

16700 SURGE PROTECTION FOR LOW-VOLTAGE ELECTRICAL POWER CIRCUITS



SECTION 15005 - MECHANICAL 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 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 15 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 15. 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.

PROJECT NAME
PROJECT NUMBER

This is a sample cover sheet. Use one for each shop drawing.

ARCHITECT/ENGINEER: Watford Engineering, Inc.

CONTRACTOR: XYZ Construction

Use whatever standard headings you want here

SUBCONTRACTOR: ABC Mechanical Contractor

SUPPLIER: Jones Supply Co.

MANUFACTURER: Various

DATE: 2/15/2005

SECTION: 15545/Hydronic Specialties

List each item separately

1. Vent valves - Hoffman No. 62

Typical - list mfr name & model number

2. In-line air separators - Bell & Gossett RL-4

3. Diaphragm type compression tanks - Bell & Gossett B-200

4. Pump suction diffusers - Bell & Gossett ED-3

5. Triple duty valves - Bell & Gossett 3D-4S

6. Shot feeders - J. Woods No. 2

7. Pressure relief valves - Watts No. 6

General Contractor's APPROVAL stamp must be on submittal.

8. Pressure reducing valves - Bell & Gossett No. 7

END OF SECTION 15005

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 15020 - CODES AND STANDARDS

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 This is a Basic Mechanical Requirements section. Provisions of this section apply to work of all Division 15 sections.

2 CODES

2.1 All work under Division 15 shall be constructed in accordance with the codes listed herein. The design has been based on the requirements of these codes; and while it is not the responsibility of the Contractor to verify that all work called for complies with these codes, he shall be responsible for calling to the Architect/Engineer's attention any drawings or specifications that are not in conformance with these or other codes prior to ordering equipment or installing work.

2.2 Comply with regulations and codes of utility suppliers.

2.3 Where no specific method or form of construction is called for in the contract documents, the Contractor shall comply with code requirements when carrying out such work.

2.4 Where code conflict exists, generally the most restrictive requirement applies. Comply with current code edition, unless noted.

2.5 Additional codes or standards applying to a specific part of the work may be included in that section.

2.6 The following codes govern the work:

1) Florida Building Code Eighth Edition, 2023 Building
2) Florida Building Code Eighth Edition, 2023 Plumbing
3) Florida Building Code Eighth Edition, 2023 Mechanical
4) Florida Fire Prevention Code Eighth Edition, 2023
5) National Electric Code (NFPA 70).
6) Life Safety Code (NFPA 101).
7) Installation of Air Conditioning and Ventilation Systems (NFPA 90A)
8) Florida Building Code Eighth Edition, 2023 Energy
9) Florida Building Code Eighth Edition, 2023 Accessibility
10) Florida Americans with Disabilities Accessibility Implementation Act (October 1, 1993) as described in Accessibility Requirements Manual, Department of Community Affairs (January 1, 1997).
11) Americans with Disabilities Act Accessibility Guidelines (ADAAG), January, 1994.

3 STANDARDS

All mechanical materials, installation and systems shall meet the requirements of the following standards, including the latest addenda and amendments, to the extent referenced:

1) Underwriters' Laboratories (UL)
2) American National Standards Institution (ANSI)
3) American Society of Testing Materials (ASTM)
4) National Fire Protection Association (NFPA)
5) National Electrical Manufacturers Association (NEMA)
6) Air Conditioning and Refrigeration Institute (ARI)
7) Sheet Metal and Air Conditioning Contractors' National Association (SMACNA)
8) American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE)
9) Air Movement and Control Association (AMCA)

END OF SECTION 15020

SECTION 15030 - MECHANICAL RELATED WORK

1 GENERAL REQUIREMENTS

1.1 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 This is a Basic Mechanical Requirements section. Provisions of this section apply to work of all Division 15 sections.

1.3 Coordinate with the General Contractor for all cutting and patching. Contractors performing Division 15 work shall inform the General Contractor of all cutting and patching required prior to bidding and shall coordinate installation.

2 SITE WORK

2.1 Specific requirements for excavation and backfill for underground piping are contained in Section 15190.

2.2 Refer to Division 2, Sitework for:

2.2.1 All water, sewer, and storm water piping greater than five feet from the building.

3 CONCRETE

3.1 Refer to Division 3, Concrete for:

3.1.1 Rough grouting in and around mechanical work.

3.1.2 Patching concrete cut to accommodate mechanical work.

4 MASONRY

4.1 Refer to Division 4, Masonry for:

4.1.1 Installation of wall louvers.

4.1.2 Installation of access doors in walls.

5 METALS

5.1 Refer to Division 5, Metals for:

5.1.1 Framing openings for mechanical equipment.

5.2 The following is part of Division 15 work.

5.2.1 Supports for mechanical work.

5.3 The following is part of Division 15 work, complying with the requirements of Division 7.

5.3.1 Fire barrier penetration seals.

6 FINISHES

6.1 Refer to Division 9, Finishes for:

6.1.1 Painting access panels.

6.1.2 Painting color-coded mechanical work indicated for continuous painting. See color schedule in Division 15 section, "Mechanical Identification".

6.1.3 Installation of access doors in gypsum drywall.

6.2 Colors shall be selected by the Architect for all painting of exposed mechanical work in occupied spaces, unless specified herein. Do not paint insulated or jacketed surfaces.

6.3 Perform the following as part of Division 15 work:

6.3.1 Touch up painting of factory finishes.

6.3.2 Painting of all hangers.

6.4 Provide the following as part of Division-15 work:

6.4.1 All ducts, fans, connections, and related devices to make kitchen hoods operational.

6.4.2 All trim including faucets, waste connections, drain traps, vents, valves, piping, flashing, fittings, strainers, and other materials necessary to make equipment operational. Provide rough-in for all equipment. Provide final connections for all equipment.

6.4.3 All fixtures specified in Section 15430.

7 ELECTRICAL

7.1 Mechanical contractor shall coordinate the exact electrical requirements of all mechanical equipment being provided with the electrical contractor. Where approval submittals are required, this coordination shall be accomplished prior to making the submittals. The electrical design shown on the drawings supports the mechanical equipment basis 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 design 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.

7.2 Mechanical contractor shall provide all HVAC control wiring including the Energy Management Control system sensors, alarms, and input/output signals and all relays, interlocks, warning lights, and control devices, in conduit and complying with the requirements of Division 16. The intent is for the mechanical contractor to be responsible for the entire HVAC control system, including point-to-point wiring.

7.3 Electrical contractor shall provide disconnect switches, starters, and contactors for mechanical equipment unless specifically noted as being furnished as part of mechanical equipment.

7.4 Electrical contractor shall provide all power wiring, raceway and devices, and make final electrical connections to all mechanical equipment, switches, starters, contactors, controllers, and similar equipment.

END OF SECTION 15 03 0

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 15105 - 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-15 Basic Mechanical Materials and Methods section, and is part of each Division-15 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-15 sections.

1.4 Codes and Standards:

1.4.1 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:

1.5.1 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.

2.4.1.3 DWV Copper Tube: ASTM B306.

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 Wrought-Copper Solder-Joint Drainage Fittings: ANSI B16.29.

2.4.2.4 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.

2.5.1.2 PVC Sewer Pipe: ASTM D-3034.

2.5.2 Fittings:

2.5.2.1 PVC Solvent Cement: ASTM D-2564.

2.5.2.2 PVC DWV Socket: ASTM D-2665.

2.5.2.3 PVC Sewer Socket: ASTM D-3034.

2.5.2.4 PVC Schedule 40 Socket: ASTM D-2466.

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 Plastic Pipe Joints: Comply with manufacturer's instructions and recommendations, and with applicable industry standards.

3.2.4.1 Solvent-cemented joints shall be made in accordance with ASTM D-2235 and ASTM F-402.

3.2.4.2 PVC sewer pipe bell/gasket joints shall be installed in accordance with ASTM D-2321.

3.2.5 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. 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 15105

SECTION 15110 - 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-15 Basic Materials and Methods section, and is part of each Division-15 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-15 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.

1.5 Approval Submittals: When required by other Division-15 sections, 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-15 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 40º to 45º, 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. Nibco T-585-70. Stockham S216-BR-R-T. Milwaukee BA125. 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. Nibco F515-CS series. Apollo 88-240.

2.6 Valve Features:

2.6.1 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

2.6.2 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.

3.2 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 flow.

END OF SECTION 15110.

SECTION 15120 - 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-15 Basic Mechanical Materials and Methods section, and is part of each Division-15 section making reference to or requiring piping specialties specified herein.

1.3 Approval Submittals:

1.3.1 Product Data: Submit product data with installation instructions and UL listing for:

Fire barrier sealants.

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 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 ¼" 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 ¼" above level floor finish, and ¾" 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 ¾" 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

END OF SECTION 15120.

SECTION 15135 - 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-15 Basic Mechanical Materials and Methods section, and is part of each Division-15 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-15 sections.

1.4 Approval Submittals: When required by other Division-15 sections, submit product data sheets for each type of vibration isolation equipment including configuration and rating data. Submit with Division-15 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-15 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-15 section "Ductwork Accessories" so that all vibrating equipment is fully isolated.

END OF SECTION 15135.

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 15150 - 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-15 Basic Materials and Methods section, and is a part of each Division-15 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-15 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.

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. For pipe 8" and over, install wood insulation saddles.

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 Concrete housekeeping bases will be provided as work of Division 3. Furnish to Contractor scaled layouts of all required bases, with dimensions of base, and location to column center lines. Furnish templates, anchor bolts, and accessories necessary for base construction.

3.5.2 Provide concrete housekeeping bases for all floor mounted equipment furnished as part of the work of Division 15. 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.

3.5.3 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 15150.

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 15160 - 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-15 Basic Mechanical Materials and Methods section, and is part of each Division-15 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-15 sections.

1.4 Refer to Division-16 sections for identification requirements of electrical work; not work of this section. Refer to other Division-15 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-15 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.

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 Valve Identification: Provide coded valve tag on every valve, cock and control device in each piping system; exclude check valves, valves within factory-fabricated equipment units, plumbing fixture faucets, convenience and lawn-watering hose bibs, and shut-off valves at plumbing fixtures, HVAC terminal devices and similar rough-in connections of end-use fixtures and units. Coordinate code with operating instructions.

3.5 Valve Charts: Provide framed, glass covered valve charts in each mechanical room. Identify coded valve number, valve function, and valve location for each valve.

3.6 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:

3.6.1 Main control and operating valves, including safety devices.

3.6.2 Meters, gauges, thermometers and similar units.

3.6.3 Fans, blowers, primary balancing dampers and VAV boxes.

3.6.4 HVAC air handlers and fan coil units.

3.6.5 Air conditioning indoor and outdoor units.

3.7 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.

3.8 Adjusting and Cleaning:

3.8.1 Adjusting: Relocate any mechanical identification device which has become visually blocked by work of this division or other divisions.

3.8.2 Cleaning: Clean face of identification devices, and glass frames of valve charts.

END OF SECTION 15160

SECTION 15170 - 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-15 Basic Mechanical Materials and Methods section, and is part of each Division-15 section making reference to or requiring access panels specified herein.

1.3 Approval Submittals:

1.3.1 Product Data: When required by other Division-15 sections, submit product data for access doors. Submit with Division-15 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 Acudor, Milcor, Jay R. Smith, Zurn, BOICO, Elmdor, or approved equal.

2.2 General: Where floors, walls and ceilings must be penetrated for access to 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 steel construction with welds ground smooth; 16-gauge frames and 14-gauge flush panel doors; 175° swing with concealed spring hinges; flush screw-driver-operated cam locks; factory-applied rust-inhibitive prime-coat paint finish.

3 EXECUTION

3.1 Access doors shall be installed to operate and service all mechanical 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. Access doors shall have factory applied protective phosphate coating and baked enamel primer suitable for field painting.

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 15170.

SECTION 15180 - 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-15 Basic Mechanical Materials and Methods section, and is part of each Division-15 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.

2.8.3 Gas: Test with air or nitrogen at 150% of normal working pressure, but not less than 25 psig. The test and check for leaks shall be in accordance with NFPA-54.

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 Blowdown all gas systems with air or nitrogen (at a rate of flow exceeding design) at least three times or until no residue shows at each outlet. Reverse blowdown systems from smallest piping to largest piping.

3.4 Sterilization of Domestic Water Systems:

3.4.1 Prerequisites: All new hot and cold water piping installed (complete), all fixtures connected, system flushed out, and system filled with water.

3.4.2 The shut off valve at the point of connection 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 point of connection.

3.4.3 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.

3.4.4 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.

3.4.5 The Architect/Engineer shall be notified 24 hours prior to the procedure so that it can be witnessed.

3.4.6 Provide sampling and certified report by an independent testing lab. Provide written Health Department approval of disinfection samples.

3.5 Fuel Gas: Purge all fuel gas systems in accordance with NFPA 54.

END OF SECTION 15180

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 15190 - 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-15 Basic Mechanical Materials and Methods section, and is part of each Division-15 section making reference to or requiring excavation and backfill specified herein.

1.3 Refer to other Division-15 sections and/or drawings for specific requirements of the particular piping system being installed. Where another Division-15 section or the drawings conflict with requirements of this section, the other Division-15 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 15190.

SECTION 15205 - INSULATION FOR PLUMBING PIPE AND 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-15 Basic Mechanical Materials and Methods Sections apply to work of this section.

1.3 Approval Submittals:

1.3.1 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

1.4 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 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, 141º-180° F: up to 1-1/4" pipe - 1½" thick, over 1-1/4" pipe 2" thick.

3.2.1.2 Domestic hot water and hot water return, 95º-140° F: up to 3" pipe - 1½" thick, over 3" pipe - 2" thick.

3.2.1.3 Cold water pipe in unconditioned space: ½" 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 15205.

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 15210 - 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-15 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 200ºF.)

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 Flexible Unicellular Pipe Insulation:

3.2.1 Insulate the following piping systems:

Condensate drains from air conditioning units - ½" thick.
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 15210

SECTION 15230 - 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-15 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 350ºF). 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: Insulate all supply, return and outdoor air ductwork and the backs of all ceiling supply outlets with 2" thick fiberglass blanket insulation with vapor barrier.

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 15230.

SECTION 15405 - 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-15 Basic Mechanical Requirements and Basic Mechanical Materials and Methods sections apply to work of this section.

1.3 Extent of potable water systems work, is indicated on drawings and schedules, and by requirements of this section.

1.4 Refer to appropriate Division-2 sections for exterior potable water system; not work of this section unless noted.

1.5 Insulation for potable water piping is specified in other Division-15 sections, and is included as work of this section. Insulation requirements include:

Domestic hot water piping
Cold water piping outside of the building envelope.

1.6 Excavation and backfill required in conjunction with water piping is specified in other Division-15 sections, and is included as work of this section.

1.7 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.

1.8 Approval Submittals:

1.8.1 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

1.9 Test Reports and Verification Submittals:

1.9.1 Disinfection: Submit report by Health Department.

1.10 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-15 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-15 Basic Mechanical 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 Solder joints shall be made with 95-5 solder.

2.5 Piping Specialties: Provide piping specialties complying with Division-15 Basic Mechanical Materials and Methods section "Piping Specialties".

2.6 Supports and Anchors: Provide supports and anchors complying with Division-15 Basic Mechanical Materials and Methods section "Supports and Anchors".

2.7 Interior Valves: Provide valves complying with Division-15 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 Exterior Valves: Provide as indicated, gate valves, AWWA C500, 175 psi working pressure. Provide threaded, flanged, hub, or other end configurations to suit size of valve and piping connections. Provide inside screw type for use with curb valve box, iron body, bronze-mounted, double disc, parallel seat, non-rising stem. Clow Corp., Dresser Mfg., Fairbanks Co., Kennedy, Stockham.

2.9 Hose Bibbs: Provide rough nickel plated hose bibbs with lock shield compression stop and 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.

2.10 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 key operated control valve with all bronze interior parts, replaceable seat washer, screwdriver operated stop valve in supply, and 3/4” male threaded hose connection. Zurn Z1350 or equal by Acorn or Woodford.

2.11 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.

2.12 Meters and Gauges: Provide meters and gauges complying with Division-15 Basic Mechanical Materials and Methods section "Meters and Gauges", in accordance with the following listing:

Thermometers
Pressure gauges
Calibrated balancing cocks

2.13 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.

2.14 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.

2.15 Access Doors: Provide access doors to service all valves and other devices as required in

accordance with Division-15 Basic 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 mechanical identification in accordance with Division-15 Basic Mechanical Materials and Methods section "Mechanical Identification".

3.3 Install water distribution piping in accordance with Division-15 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-15 Basic Mechanical Materials and Methods section "Piping Specialties".

3.5 Install supports and anchors in accordance with Division-15 Basic Mechanical Materials and Methods section "Supports and Anchors".

3.6 Install valves in accordance with Division-15 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.

3.6.5 Calibrated Balancing Cocks: Install in each hot water recirculating loop, and elsewhere as 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-15 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 Install water hammer arresters in upright position, in locations and of sizes indicated in accordance with PDI Standard WH-201.

3.12 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.

3.13 Locate and coordinate installation of access doors for all valves and devices in accordance with Division-15 Basic Mechanical Materials and Methods section “Access Doors”.

3.14 Piping Tests: Test, clean, and sterilize potable water piping in accordance with testing requirements of Division-15 Basic Mechanical Materials and Methods section "Testing, Cleaning, and Sterilization of Piping Systems".

END OF SECTION 15405.

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 15410 - 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-15 Basic Mechanical Requirements and Basic Mechanical Materials and Methods sections apply to work of this section.

1.3 Extent of soil waste and vent systems work is indicated on drawings and schedules, and by requirements of this section.

1.4 Refer to other Division-15 sections for site sanitary system; not work 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-15 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
Grease interceptors

1.10 O&M Data Submittals: Submit a copy of all approval submittals. 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, 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-15 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-15 Basic Materials and Methods section "Piping Specialties".

2.5 Supports and Anchors: Provide supports and anchors complying with Division-15 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 8.75”x8.75” hinged 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.

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-15 Basic Mechanical 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-15 Basic Mechanical Materials and Methods section "Piping Specialties".

3.4 Install supports and anchors in accordance with Division-15 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 Installation of Floor Drains: Install floor drains in accordance with manufacturer's written instructions and in locations indicated.

3.7.1 Coordinate flashing work with work of waterproofing and adjoining substrate work.

3.7.2 Install floor drains at low points of surface areas to be drained, or as indicated. Set tops of drains flush with finished floor.

3.7.3 Install drain flashing collar or flange so that no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes, where penetrated.

3.7.4 Position drains so that they are accessible and easy to maintain.

3.8 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.

3.9 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.

3.10 Test, clean, flush, and inspect soil and waste piping in accordance with requirements of Division-15 Basic Mechanical Materials and Methods section "Testing, Cleaning and Sterilization of Piping Systems".

END OF SECTION 15410.

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 15430 - 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-15 Basic Mechanical Requirements and Basic Mechanical Materials and Methods sections apply to work of this section.

1.3 Extent of plumbing fixtures work required by this section is indicated on drawings and schedules, and by requirements of this section.

1.4 Refer to Division-16 sections for field-installed electrical wiring required for plumbing fixtures; not work of this section.

1.5 Codes and Standards:

1.5.1 Plumbing Fixture Standards: Comply with applicable portions of Florida Building Code-Plumbing pertaining to materials and installation of plumbing fixtures.

1.5.2 ANSI Standards: Comply with applicable ANSI standards pertaining to plumbing fixtures and systems.

1.5.3 PDI Compliance: Comply with standards established by PDI pertaining to plumbing fixture supports.

1.5.4 UL Listing: Construct plumbing fixtures requiring electrical power in accordance with UL standards and provide UL-listing and label.

1.5.5 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.

1.5.6 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".

1.6 Approval Submittals:

1.6.1 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.

1.7 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.

1.8 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 drawings 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 Automatic Faucets: Provide electronic sensor-operated faucets with 0.5 gpm vandal-resistant spray head. Set volume adjustment at 0.25 gallons per operation. Provide box-mounted, hard-wired transformer (120 VAC primary - 24 VAC secondary) with each faucet. All wiring and electrical connections shall be provided by Division - 16.

2.5.1.2 Aerators: Provide aerators of types approved by Health Department having jurisdiction.

2.5.1.3 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.

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.

Provide loose key stops.

2.5.2.1 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 or set screws.

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., Oasis.

2.9 Service Sinks:

2.9.1 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.

2.9.2 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.

2.10 Stainless Steel Sinks:

2.10.1 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.

2.10.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. Elkay, Just

2.10.3 Stainless Steel Sink Schedule:

2.11 Water Heaters:

2.11.1 Electric Water Heaters:

2.11.2 Accessories: VB, relief, pan, stand, etc.

2.11.3 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.

2.12 Thermostatic Mixing Valves:

2.12.1 General:

2.12.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item: Zurn, Watts, or approved equal.

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 equal.

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, showers, and 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 15430

SECTION 15440 - GAS SYSTEM

1 GENERAL

1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specifications sections, apply to work of this section.

1.2 Division-15 Basic Mechanical Requirements and Basic Mechanical Materials and Methods sections apply to work of this section.

1.3 Extent of gas systems work, is indicated on drawings and schedules, and by requirements of this section.

1.4 Excavation and backfill required in conjunction with gas service piping is specified in Division-15 sections, and is included as work of this section.

1.5 Codes and Standards

1.5.1 NFPA Compliance: Fabricate and install gas systems in accordance with NFPA 54 "National Fuel Gas Code". Provide LP gas storage and handling equipment in accordance with NFPA 58 "Standard for Storage and Handling of Liquified Petroleum Gases".

1.5.2 Utility Compliance: Fabricate and install gas systems in accordance with local gas utility company requirements and standards.

1.6 Approval Submittals:

1.6.1 Product Data: Submit manufacturer's technical product data and installation instructions as follows:

1.6.1.1 Gas cocks and/or ball valves

1.6.1.2 Gas regulators

1.6.1.3 Gas appliance connectors.

1.7 O&M Data Submittals: Submit a copy of approval submittals. Submit maintenance data and parts lists for gas cocks, ball valves, control valves, lab gas cocks, appliance connectors, gas vents, LP storage tanks, regulators. 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, 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 NFPA 54 where applicable. Base pressure rating on gas piping system maximum design pressures. Provide sizes and types matching piping and equipment connections; provide fittings of materials which match pipe materials used in gas systems. Where more than one type of materials or products are indicated, selection is Installer's option.

2.2 Identification: Provide identification complying with Division-15 Basic Mechanical Materials and Methods section "Mechanical Identification".

2.3 Pipes and Fittings: Provide pipes and pipe fittings complying with Division-15 Basic Mechanical Materials and Methods section "Pipes and Pipe Fittings", in accordance with the following listing:

2.3.1 Gas Service Piping:

2.3.1.1 All Pipe Sizes: Black steel pipe; Schedule 40; wrought-steel buttwelding fittings.

2.3.1.2 Wrapping: Machine wrap pipe using 50% overlap wrap, with polyvinyl chloride tape. Hand wrap fittings using 100% overlap wrap extending 6" beyond fitting onto wrapped pipe. Comply with tape manufacturer's installation instructions.

2.3.1.3 Pipe Sizes ½" Through 12": Thermoplastic gas pressure pipe, tubing, and fittings complying with ASTM D 2513.

2.3.1.4 Pipe Sizes 2" Through 12": Reinforced epoxy resin gas pressure pipe and fittings complying with ASTM D 2517.

2.3.2 Building Distribution Piping:

2.3.2.1 Pipe Size 2" and Smaller: Black steel pipe; Schedule 40; malleable-iron threaded fittings.

2.3.2.2 Pipe Size 2½" and Larger: Black steel pipe; Schedule 40; wrought-steel buttwelding fittings.

2.4 Piping Specialties: Provide piping specialties complying with Division-15 Basic Mechanical Materials and Methods section "Piping Specialties".

2.5 Sealants: Provide UL-listed or AGA approved sealants for gas piping.

2.6 Supports and Anchors: Provide supports and anchors complying with Division-15 Basic Mechanical Materials and Methods section "Supports and Anchors".

2.7 Valves: Provide valves complying with Division-15 Basic Mechanical Materials and Methods section “Valves” and in accordance with the following listing.

2.7.1 Gas Cocks 2" and Smaller: UL-listed, AGA approved, 150 psi non-shock WOG, full port, bronze straightway cock, flat or square head, threaded ends.

2.7.2 Gas Cocks 2½" and Larger: UL-listed, CGA approved, MSS SP-78; 175 psi, lubricated plug type,

full port, semi-steel body, single gland, wrench operated, flanged ends.

2.7.3 Wrenches: Provide operating wrenches for all gas cocks serving boilers.

2.7.4 Acceptable Manufacturers for gas cocks: Subject to compliance with requirements, provide products of one of the following: Resun R1430 and R1431, Milliken 200M and 201M or approved equal.

2.8 Gas Appliance Tube Connectors: Provide commercial grade appliance connectors with a 2 year manufacturer's warranty. Tubing shall be Type 304 stainless steel tubing with type 304 stainless steel braiding to protect tubing from elongation. Tubing shall be complete with factory installed end connectors. Provide products that are AGA or CGA approved. Indicate maximum BTU input for each length and size used on submittal.

2.9 Gas Regulators

2.9.1 Second Stage Regulators: Provide UL listed second stage (1-5 psi) adjustable regulators with integral relief valves.

2.9.2 Acceptable Manufacturers: Subject to compliance with requirements, provide regulators by Rego, or approved equal.

2.10 Gas Meter and Regulator: Provided by local utility company.

2.11 Access Doors: Provide access doors to service all valves and other devices as required in accordance with Division-15 Basic Materials and Methods Section "Access Doors".

3 EXECUTION

3.1 Examine areas and conditions under which gas systems materials and products are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer. Coordinate with gas supplier prior to starting work.

3.2 Install mechanical identification in accordance with Division-15 Basic Mechanical Materials and Methods section "Mechanical Identification".

3.3 Install gas piping in accordance with Division-15 Basic Mechanical Materials and Methods section "Pipes and Pipe Fittings".

3.3.1 Use sealants on metal gas piping threads which are chemically resistant to gas. Use sealants sparingly, and apply to only male threads of metal joints.

3.3.2 Remove cutting and threading burrs before assembling piping.

3.3.3 Do not install defective piping or fittings. Do not use pipe with threads which are chipped, stripped or damaged. Do not use bushings in the gas system.

3.3.4 Plug each gas outlet, including valves, with threaded plug or cap immediately after installation and retain until continuing piping, or equipment connections are completed.

3.3.5 Ground gas piping electrically and continuously within project, and bond tightly to grounding connection.

3.3.6 Install drip-legs in gas piping where indicated, and where required by code or gas company requirements.

3.3.7 Install "Tee" fitting with bottom outlet plugged or capped, at bottom of pipe risers.

3.3.8 Use dielectric unions where dissimilar metals are joined together.

3.3.9 Install piping with 1/64" per foot (1/8%) downward slope in direction of flow.

3.3.10 Install piping parallel to other piping, but maintain minimum of 12" clearance between gas piping and steam or hydronic piping above 200°F.

3.4 Gas Service: Arrange with utility company to provide gas service to indicated location with meter, pressure regulator and shutoff at terminus. Consult with utility as to extent of its work, costs, fees, and permits involved. The Contractor shall pay such costs and fees and obtain permits.

3.5 Install piping specialties in accordance with Division-15 Basic Mechanical Materials and Methods section "Piping Specialties".

3.6 Install supports and anchors in accordance with Division-15 Basic Mechanical Materials and Methods section "Supports and Anchors".

3.7 Installation of Valves:

3.7.1 Gas Cocks: Provide at connection to gas train for each gas-fired equipment item; and on risers and branches where indicated.

3.7.2 Locate gas cocks where easily accessible, and where they will be protected from possible injury.

3.7.3 Control Valves: Install as indicated. Refer to Division 16 for wiring; not work of this section.

3.8 Equipment Connections: Connect gas piping to each gas-fired equipment item, with drip leg and shutoff gas cock. Comply with equipment manufacturer's instructions.

3.9 Appliance Connectors: Install tubing, valves, connectors, fittings in accordance with their listing. Hose, fittings and valves shall not restrict gas flow and shall be rated for the capacity of the appliance they serve. Hoses shall not be crimped. Hoses behind movable appliances shall not be crimped when appliance is extended from wall or when appliance is set in working position. Appliance restraining device shall set to engage just prior to the connector

being fully extended. Check all tubing, piping, fittings & valves for leakage at less than 50 part per million.

3.10 Locate and coordinate installation of access doors for all valves and devices in accordance with Division-15 Basic Mechanical Materials and Methods section “Access Doors”.

3.11 Piping Tests: Inspect, test, and purge gas systems in accordance with NFPA 54, local utility requirements, and Division-15 Basic Mechanical Materials and Methods section "Testing, Cleaning and Sterilization of Piping Systems".

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 15710 - SPLIT SYSTEM AIR CONDITIONING UNITS

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-15 Basic Mechanical Materials and Methods sections apply to work of this section.

1.3 Refer to other Division-15 sections for testing, adjusting, and balancing of air conditioning units (AHUs).

1.4 Approval Submittals:

1.4.1 Product Data: Submit manufacturer's technical product data, including dimensions, ratings, electrical characteristics, weight, capacities, materials of construction, and installation instructions.

Split system units
Vibration Isolation

1.5 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.

2 PRODUCTS

2.1 Quality Assurance:

2.1.1 Provide units tested by UL, ARL or ETL.

2.1.2 Construct refrigeration system in accordance with ASHRAE 15 (ANSI B 9.1) "Safety Code for Mechanical Refrigeration".

2.1.3 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.

2.1.4 Provide units with an EER or SEER2 that meets the Florida Energy Efficiency Code and the schedules on the drawings.

2.1.5 Provide units with EPA approved refrigerant and factory installed refrigerant monitor.

2.1.6 Acceptable Manufacturers: Subject to compliance with requirements provide units by: Carrier, Trane, Lennox, York or approved equal.

2.2 General:

2.2.1 Units shall be factory-assembled, wired and tested. All controls shall be factory-adjusted and preset to the design conditions.

2.2.2 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.

2.2.3 Supports: Provide concrete pad 4" larger than the unit on all sides.

2.3 Condensing Unit:

2.3.1 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.

2.3.2 Condenser Coil: Construct of copper nonferrous tubes and nonferrous fins. Provide inlet guard to protect condenser fins. Provide seacoast or heresite coating on the condenser coil.

2.3.3 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.

2.3.4 Service Valves: Provide for high and low pressure readings.

2.3.5 Equipment Coating: Provide clear inorganic reacted siloxane coating over all surfaces of the unit exposed to the outdoors, MicroGuard AD35 by Adsil or equal. Completely coat condenser coils, base pan, cabinet, and all exposed refrigerant parts, covers, and shields. Provide 6 to 8 micron dry film thickness and all cleaning, prep, and finish work required for first class installation. Provide 3 year warranty on the coating. Provide 72 hour notice to engineer for witnessing of field applied coatings.

2.4 Evaporator Unit:

2.4.1 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.

2.4.2 The evaporator shall include centrifugal fan, fan motor, direct drive and lubricated bearings. Motors shall be high efficiency type as per Division-15, Basic Mechanical Materials and Methods section, "Motors". 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.

2.4.3 Each unit shall be equipped with sloped IAQ drain pans under the entire evaporator coil to prevent condensate carry-over.

2.5 Electric Heater Section:

2.5.1 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.

2.5.2 Heaters shall be factory mounted and wired with all required fuses and contactors to provide single point connection.

2.6 Unit Controls:

2.6.1 All safety and operational controls shall be factory wired.

2.6.2 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.
Phase failure and low voltage protection.
Liquid line solenoid.

2.7 Refrigerant Piping:

2.7.1 Copper tubing ¾" and smaller: Type ACR, hard-drawn temper tubing; wrought-copper, solder-joint fitting; brazed joints.

2.7.2 Copper tubing 7/8" – 4-1/8": Type ACR, hard-drawn temper tubing; wrought-copper, solder-joint fitting; brazed joints.

2.7.3 Silver solder material: Silver solder bearing at least 15% silver; Sil Fos.

2.8 Basic Vibration Isolation: Provide vibration isolation products complying with Division-15 section "Vibration Isolation" and the following list:

2.8.1 Equipment Mounting: Type EM5

3 EXECUTION

3.1 Installation: Install in accordance with producer's printed instructions. Brush out fins on all coils.

3.2 Support: Mount outdoor units on concrete pads with manufacturer's recommended service and operating clearance.

3.3 Mount indoor units smaller than 5 tons on vibration isolation. Mount indoor units larger than 5 tons on vibration isolation and concrete pads.

3.4 Brush out fins on all coils.

3.5 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.

3.6 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.

3.7 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 loq 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.

3.8 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.

3.9 Construction Filters: Provide 2" 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-15 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 15710

SECTION 15810 - 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-15 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-15 section "Testing, Adjusting, and Balancing "for balancing of fans.

1.4.3 Refer to Division-15 HVAC control systems sections for control work required in conjunction with fans.

1.4.4 Refer to Division-16 sections for power supply wiring from power source to power connection on fans. Division-16 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-15 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 In-Line Centrifugal Fans:

2.3.1 Housing: Provide square weather tight housing constructed of aluminum or steel and painted inside and out with an epoxy finish. Provide venturi type inlet. Provide heavy duty duct collars. Housing and bearing supports shall be constructed of heavy gauge bolted and welded steel construction. Provide two sided access panels, located perpendicular to the motor mounting plane. Provide ½" insulated housing. Provide motor and drive cover for belt drive units.

2.3.2 Fan Wheels: Provide aluminum air foil type, backward curved, statically and dynamically balanced.

2.3.3 Drive: Provide direct or belt drive as scheduled with pre-lubricated, ball bearing, continuous duty type motors. Provide vibration isolation equipment for the entire drive.

2.3.4 Isolation and Support: Provide spring type vibration isolators and fan support brackets.

2.4 Vibration Isolation: Mount fans on vibration isolators in accordance with the requirements of Division-15 section "Vibration Isolation" and the following list.

2.4.1 Hangers: Type HA3.

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 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-15 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-16 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 15810.

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 15840 - 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
Duct liner
Adhesive
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 Liner: Fibrous glass, 1½ pcf minimum density, complying with Thermal Insulation Manufacturers Association (TIMA) AHC-101; of thickness indicated. Certainteed "Coated Ultralite", Owens Corning "Aeroflex", PPG "Textrafine", or Manville "Linacoustic".

2.2.3 Duct Liner Adhesive: Comply with ASTM C 916 "Specifications for Adhesives for Duct Thermal Insulation".

2.2.4 Duct Liner Fasteners: Comply with SMACNA HVAC Duct Construction Standards, Article S2.11.

2.2.5 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.

2.2.6 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.

2.2.7 Flexible Ducts: Provide flexible ductwork with an R-value of R-6The use of flexible ductwork for connection of supply air and return air devices is acceptable only where shown on the drawings.

2.2.7.1 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.

2.2.7.2 Acceptable Manufacturers: Subject to compliance with requirements, provide R-6 flexible ductwork by: Atco 36, Flexmaster 8M-R6 or Thermaflex M-KE R6.

2.2.8 Spin-in and Side Take-off Fittings: Provide round branch run-outs as follows.

2.2.8.1 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.

2.2.8.2 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.

2.2.9 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.

2.3.5 Fabricate duct plenums with duct liner where indicated. Laminate liner to internal surfaces of duct (100% coverage) in accordance with instructions by manufacturers of lining and adhesive, and fasten with mechanical fasteners (Grip Nails or Stic Klips) on 16 centers. On horizontal runs install top and bottom first and wedge sides between top and bottom. Apply a brush coat of fire retardant over all joints, visible cut edges, and leading edges to prevent erosion.

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.

2.5 Factory-Fabricated Double Wall Spiral Ductwork:

2.5.1 Internally Insulated Duct and Fittings: Construct with outer pressure shell, 2" thick insulation layer, and perforated inner liner. Construct shell and liner of galvanized sheet steel complying with ASTM A 527, of spiral lockseam construction, use longitudinal seam for over 59", in minimum gauges listed.

Nominal Duct Diameter		Outer Shell	Inner Liner
3" to 12"		26 ga.	24 ga.
13" to 24"	24 ga.	24 ga.	
25" to 34"	22 ga.	24 ga.	
35" to 48"	20 ga.	24 ga.	
49" to 58"	18 ga.	24 ga.	
Over 59"		16 ga.	20 ga.

Fittings and Couplings: Construct of minimum gauges listed. Provide continuous weld along seams of outer shell.

Nominal Duct Diameter		Outer Shell	Inner Liner
3" to 34"		20 ga.	20 ga.
36" to 48"	18 ga.	20 ga.	
Over 48"		16 ga.	20 ga.

Inner Liner for Straight Duct: Perforate with 3/32" holes for 22% open area. Provide metal spacers welded in position to maintain spacing and concentricity. Provide a plastic film between the perforated liner and insulation to act as a vapor barrier.

Inner Liner for Fittings: Solid sheet metal. Provide metal spacers welded in position to maintain spacing and concentricity.

2.5.2 Optional Ducts and Fittings: At Installer's option, provided that certified tests by Manufacturer show that rigidity and performance is equivalent to SMACNA standard gauge ductwork, provide ducts and fittings as follows:

Ducts: Construct of Manufacturer's standard gauge, with spiral lock seam and intermediate standing rib.

Fittings: Construct by fabricating with spot welding and bonding with neoprene-base cement in lieu of continuous weld seams.

2.5.3 Acceptable Manufacturers: Subject to compliance with requirements, provide factory-fabricated ductwork 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.

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 2" Pressure Class Ductwork: 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-15 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 15840.

SECTION 15855 - 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-15 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-15 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
Duct access doors
Flexible connections

1.6.2 O&M Data Submittals: Submit manufacturer's maintenance data including parts lists for control 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 control 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 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.

2.1.3 Acceptable Manufacturers: Subject to compliance with requirements, provide dampers by Air Balance, American Warming & Ventilating, Arrow Louver and Damper, Penn Ventilator Co., Greenheck, or Ruskin Mfg. Co.

2.2 Turning Vanes: Provide manufactured or fabricated single wall turning vanes and vane runners, constructed in accordance with SMACNA "HVAC Duct Construction Standards".

2.3 Duct Access Doors:

2.3.1 General: Provide duct access doors of size indicated, or as required for duty indicated.

2.3.2 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.

2.3.3 Acceptable Manufacturers: Subject to compliance with requirements, provide access doors by Air Balance, Inc., Duro Dyne Corp., Ruskin Mfg. Co., or Ventfabrics, Inc.

2.4 Flexible Connections:

2.4.1 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.

2.4.2 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 intake duct for each air handling unit.

3.2.4 Install turning vanes in square or rectangular 90º 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 at fire dampers, smoke dampers, and control dampers Opening size shall be per NFPA 90A for servicing fire and smoke dampers. Provide label with 1-1/2" letters to indicate location of fire protection devices.

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 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.

3.3 Adjusting And Cleaning:

3.3.1 Adjusting: Adjust ductwork accessories for proper settings.

3.3.2 Final positioning of manual dampers is specified in Division-15 section "Testing, Adjusting, and Balancing". However, the system shall be left functional with all dampers open or throttled.

3.3.3 Cleaning: Clean factory-finished surfaces. Repair any marred or scratched surfaces with manufacturer's touch-up paint.

END OF SECTION 15855.

SECTION 15860 - GRILLES, REGISTERS, 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-15 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-15 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 baked white enamel. 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, 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 trim ring for diffusers in hard ceilings to allow opening to be used for access.

2.4 Return, Exhaust, and Transfer Grilles and Registers: Provide return grilles and registers with one set of 45 degree fixed louvers, parallel to the long dimension. Provide opposed blade damper, screwdriver operated from the face for registers. 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 15860.

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 15875 - 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 ft^2 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 15875

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 15887 - BI POLAR IONIZATION AIR 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-15 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-15 air handling units section for filter boxes associated with air handling units; not work of this section.

1.5 Refer to Division-15 duct accessories section for duct access door work required in conjunction with air filters; not work of this section.

1.6 Refer to Division-16 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/cm^3 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 Air Handler Mounted Units: Plasma Generator(s) shall be supplied and installed. The mechanical contractor shall mount the Plasma Generator and wire it to the AHU control power (24VAC) as instructed by the Air Purification Manufacturer's instructions or line voltage subject to power available. Each unit shall be designed with a stainless steel casing, integral illuminated on/off switch, two 2.5mm DC power jacks, high voltage output indication light and dry contacts to prove ion output is operating properly. The dry contacts shall close to prove the ion generator is working properly and may be daisy chained in series such that only one dry contact per AHU is required to interface to the BAS or the optional DDC controller. Dry contacts proving power has been applied in lieu of the ion output is actually operating, are not acceptable.

2.1.15 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.

2.1.16 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.

2.1.17 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.

2.1.18 The contractor shall coordinate electrical requirements with air purification manufacturer during submittals.

2.1.19 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 or 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-21 sections. Do not proceed with equipment start-up until wiring installation is acceptable to equipment installer.

END OF SECTION

SECTION 15970 - 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.

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-15 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 15970.

SECTION 15985 - 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-15 Basic Mechanical Materials Sections apply to work of this section.

1.2 Description of Work:

1.2.1 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.

1.2.2 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.

1.3.1 Airflow Tolerances:

1.3.1.1 Air Handling: The supply air, return air and outdoor air quantities shall be balanced within ±5% of design values.

1.3.1.2 Exhaust Fans: The exhaust fan quantities shall be set as required to maintain the design exhaust terminal flows within ±5% of design values. If no exhaust terminals exist, exhaust fan air quantities shall be balanced within ± 10% of design values.

1.3.1.3 Ceiling Diffusers, Supply Registers, Return and Exhaust Inlets: Balance to an air quantity within ±10% of the design values.

1.3.2 Temperature Tolerances:

1.3.2.1 Air Handling Temperatures: The controlled temperatures at AHUs shall be verified to be under control within ± 1ºF of design values.

1.3.2.2 Room Temperatures: Balance systems and controls within ±2ºF of indicated settings.

1.4 Quality Assurance: The TAB Contractor shall be certified as one of the following:

1.4.1 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.

1.4.2 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.

1.4.3 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:

1.5.1 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.

1.5.2 Do not proceed until work scheduled for testing, adjusting, and balancing is clean and free from debris, dirt and discarded building materials.

1.5.3 Do not proceed until architectural work that would affect balancing (walls, ceiling, windows, doors) have been installed.

1.5.4 Testing may proceed system by system, but each HVAC system must be complete as describe herein.

1.5.5 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

1.6.1 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:

1.7.1 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:

3.1.1 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.

3.1.2 Test, adjust and balance environmental systems and components, as indicated, in accordance with procedures outlined in applicable standards, and as modified or detailed herein.

3.1.3 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 5ºF wet bulb temperature of maximum summer design condition, and within 10ºF 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.

3.1.4 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.

3.1.5 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.

3.1.6 Patch holes in insulation, ductwork and housings, which have been cut or drilled for test purposes, in manner recommended by original Installer.

3.1.7 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.

3.1.8 Include in the TAB report recommendations for correcting unsatisfactory mechanical performances when system cannot be successfully balanced.

3.1.9 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

3.2.1 Check all HVAC controls for proper location, calibration and sequence of operation.

3.2.2 Check operation of all controllers and controlled devices to verify proper action and direction. Check the operation of all interlocks.

3.3 Air Balancing

3.3.1 Leakage tests on ductwork must have been completed before air balancing.

3.3.2 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.

3.3.3 Set grille deflections as noted on plans. Modify deflections if required to eliminate drafts or objectionable air movement.

3.3.4 Record air terminal velocity after completion of balance work.

3.3.5 Record final grille and register deflection settings if different from that specified on contract drawings.

3.3.6 Record all fan speeds.

3.4 Data Collection:

3.4.1 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.

3.4.2 It is the intent of this section to record data on balanced systems, under normal operating or design conditions.

3.4.3 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.

3.4.4 Pressures:

1. Suction and discharge static pressure of each fan.
2. Suction and discharge pressure of each pump.
3. Each refrigerant suction and discharge pressure.

3.4.5 Flow rates:

1. Flow rate through each fan.

3.4.6 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.

3.5 All test openings in ductwork shall be resealed in an approved manner.

END OF SECTION 15985.

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 16000- ELECTRICAL GENERAL REQUIREMENTS

1.0 GENERAL

1.01 SECTION INCLUDES:

A. Electrical General Requirements specifically applicable to Division 16 Sections, in addition to Division 1 - General Requirements.

1.02 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.

1.03 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. Standard Building Code
2. National Fire Protection Association - NFPA
3. National Electrical Manufacturers Association - NEMA
4. National Bureau of Standards
5. American National Standards Institute - ANSI
6. Underwriters' Laboratories – UL

1.04 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.

1.05 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 actually 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.

1.06 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.

1.07 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

1.08 OBSERVATION, TESTING AND BALANCING:

A. Observation: The complete job will be, during and/or after construction, subject to the administration of the Engineer. Site visits shall be conducted by the Architect/Engineer or his designated representative as necessary to maintain compliance with the Contract requirements.

B. Testing: Prior to acceptance by the Owner/Engineer, the Contractor shall conduct and record insulation tests of all feeder and motor branch circuits. The insulation testing shall be accomplished utilizing an meg-ohm meter. Verification of test results shall be witnessed by the Architect or his designated representative. The

Contractor shall submit a written report of all readings of each feeder and circuit.

C. Balancing: All branch circuits and feeders shall be tested under maximum and typical load conditions, and loads shall be balanced on the phases of the electrical system. The Contractor shall submit written report of final load readings of all loads on each feeder.

1.09 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

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 16100 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS, CABLES, AND DEVICES

1.0 GENERAL

1.01 RELATED DOCUMENTS:

A. Section 16000 - Electrical General Requirements, apply to the work specified in this Section, with additions and modifications specified herein.

1.02 SECTION INCLUDES:

A. Wire and Cable

B. Wiring Devices

2.0 PRODUCTS

2.01 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. Aluminum wire may be used for feeder conductors provided the local AHJ and owner approves and the minimal allowable ampacity (as specified) is met. 'MC' cable allowed for connection to light fixtures above accessible ceilings with a maximum length of 6'.

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.

2.02 WIRING DEVICES AND WALL PLATES:

A. Manufacturers:
1. Hubbell
2. Leviton
3. Arrow Hart

B. Wall Switches: AC general use, quiet-operating snap switch rated 20 amperes and 120/277 volts AC, with plastic toggle handle, ivory color.

1. Single Pole Switch: Hubbell 1221-I

2. Three Way Switch: Hubbell 1223-I

C. Receptacle:

1. Convenience Receptacle Configuration: Type 5-20R, plastic face, **ivory color**. Model 5262-I manufactured by Hubbell.

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. Device shall be compliant to the requirements of UL 943.

D. Wall Dimmer: Rotary dial or slide type, **color by architect**. Model C-2000 manufactured by Lutron.(or Leviton equal) Rating of 2000 watts at 120 volts, AC.

E. Decorative Cover Plate: Smooth Stainless steel, **color by architect**, 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.

3.0 EXECUTION

3.01 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.

3.02 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 splashbacks, 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 under the provisions of Section 16100. Size cord for connected load and rating of branch circuit over-current protection.

K. 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 coverplates on all devices/boxes in wet or outdoor locations.

3.03 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

SECTION 16200 - RACEWAY SYSTEMS

1.0 GENERAL

1.01 RELATED DOCUMENTS:

A. Section 16000 - Electrical General Requirements, apply to the work specified in this section, with additions and modifications specified herein.

1.02 SECTION INCLUDES:

A. Conduit and Conduit Fittings

B. Electrical Boxes and Fittings

C. Cable Tray

2.0 PRODUCTS

2.01 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.

2.02 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 feralloy, 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.

2.03.1 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.

3.0 EXECUTION

3.01 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.

3.02 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 Schedule 40 PVC conduit.

2. Installations In Concrete: Rigid steel conduit, or Schedule 40 PVC conduit.

3. In Slab Above Grade: Rigid steel conduit, or Schedule 40 PVC conduit. Where likely to be damaged, use Schedule 80 PVC in lieu of Schedule 40 PVC.

4. Exposed Outdoor Locations: Rigid steel conduit or Schedule 40 PVC. Schedule 80 PVC to be used in areas prone to damage.

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.

7. Exposed Dry Interior Locations: Rigid steel conduit or electrical metallic tubing.

8. Feeders: Galvanized rigid steel conduit and PVC conduit on all feeders. Schedule 40 PVC may be used in environments where there is an unlikely probability that the conduit will be damaged. Otherwise, use schedule 80 PVC if RMC is not used.

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, 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 90° 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 inch separation, minimum. In acoustic-rated walls provide 24 inch separation minimum.

5. Do not damage insulation.

END OF SECTION

SECTION 16300 - SERVICE AND DISTRIBUTION

1.0 GENERAL

1.01 RELATED DOCUMENTS:

A. Section 16000 - Electrical General Requirements, apply to the work specified in this Section, with additions and modifications specified herein.

1.02 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

1.03 SYSTEM DESCRIPTION:

A. The new 120/240V volts, single phase, three wire, 60 Hz fed overhead from an overhead transformer bank. Electrical drawings to override specifications when determining size and type of service to be installed.

1.04 PROJECT CONDITIONS:

A. Verify field measurements for the equipment to ensure proper fit within the space proposed.

1.05 UTILITY REQUIREMENTS:

A. The serving utility is **FP&L.**

B. Metering shall be provided by the utility company and installed by the electrical contractor.

2.0 PRODUCTS

2.01 SWITCHBOARD:

A. Manufacturers:

1. Square D Company

2. Cutler-Hammer

3. Siemens

4. General Electric

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 1General 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.

2.02 PANELBOARDS:

A. Manufacturers:

1. Square D Company Only…No Equals Accepted!

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.

2.03 ENCLOSED SWITCHES:

A. Manufacturers:

1. Square D Company only…No Equals Accepted!

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, 3R, and 4X 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.

2.04 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.

2.05 TRANSFORMERS:

A. Manufacturers:

1. Square D Company
2. ITE-Siemens
3. General Electric Company
4. Cutler Hammer

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.

2.06 ENCLOSED CIRCUIT BREAKERS:

A. Manufacturers:

1. Square D Company only…No Equals Accepted!

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.

2.07.1 PLUG-IN DUCT

A. Manufacturers:

1. Square D Company

2. ITE-Siemens

3. General Electric

4. Cutler Hammer

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

3.0 EXECUTION

3.01 EXAMINATION AND PREPARATION:

A. Make arrangements with utility company to obtain permanent electrical service to the facility.

3.02 INSTALLATION:

A. Install utility services in accordance with utility company standards and requirements.

1. Underground Service: Refer to 'Power Riser Diagram' for details. (Verify with utility prior to bid/construction.)

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

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 16400 - BASIC ELECTRICAL MATERIALS AND METHODS

1.0 GENERAL

1.01 RELATED DOCUMENTS:

A. Section 16000 - Electrical General Requirements, apply to the work specified in this Section, with additions and modifications specified herein.

1.02 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

1.03 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.

2.0 PRODUCTS

2.01 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.

2.02 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, or Powerstrut.

C. Miscellaneous Hardware: Standard sizes treated for corrosion resistance.

2.03 IDENTIFICATION:

A. Nameplates: Engraved three-layer laminated plastic, black letters on white background.

B. Wire and Cable Markers: Cloth type, split sleeve type, or tubing type.

C. Panel Directories: Typewritten under plastic cover.

3.0 EXECUTION

3.01 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 cold water 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 connections 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 1/4 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

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 16500-LED INTERIOR 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. Coordination Drawings: Reflected ceiling plan(s) and other details, drawn to scale and coordinated with each other, using input from installers of the items involved:

B. Seismic Qualification Certificates: For luminaires, accessories, and components, from manufacturer.

C. Product Certificates: For each type of luminaire.

D. 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.

B. Seismic Performance: Luminaires and lamps shall be labeled vibration and shock resistant.

1. The term "withstand" means "the luminaire will remain in place without separation of any parts when subjected to the seismic forces specified."

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: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by an NRTL.
4. FM Global Compliance: 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).

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..

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 Retain this article for exposed, 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.

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 8**0** 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. Wires: ASTM A 641/A 641 M, Class 3, soft temper, zinc-coated steel, 12 gage.

D. Rod Hangers: 3/16-inch minimum diameter, cadmium-plated, threaded steel rod.

E. Hook Hangers: Integrated assembly matched to luminaire, line voltage, and equipment with threaded attachment, cord, and locking-type plug.

PART 3 - EXECUTION

3.1 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

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 16612 - GENERATOR SET (80KW NG)

1. Scope of Work

1.1. It is the intent of this specification to secure an engine-driven generator set that has been factory built, production-tested, and site-tested together with all accessories necessary for a complete installation as shown on the plans and drawings and specified herein.

1.2. Any and all exceptions to the published specifications shall be subject to the approval of the engineer.

1.3. The power system shall be furnished by a single manufacturer who shall be responsible for the design, coordination, and testing of the complete system. The entire system shall be installed as shown on the plans, drawings, and specifications herein.

1.4. The equipment shall be produced by a manufacturer who has produced this type of equipment for a period of at least 10 years and who maintains a service organization available twenty-four hours a day throughout the year.

1.5. The equipment shall be supported by a local distributor who has had local facilities for at least 5 years and who maintains a local service organization available twenty-four hours a day throughout the year.

2. General Requirements

2.1. It is the intent of this specification to secure a generator set system that has been tested during design verification, in production, and at the final job site. The generator set will be a commercial design and will be complete with all of the necessary accessories for complete installation as shown on the plans, drawings, and specifications herein. The equipment supplied shall meet the requirements of the National Electrical Code and applicable local codes and regulations.

2.2. All equipment shall be new and of current production by a national firm that manufactures the generator sets and controls and transfer switches, and assembles the generator sets as a complete and coordinated system. There will be one-source responsibility for warranty, parts, and service through a local representative with factory-trained servicemen.

3. Submittal

3.1. The submittal shall include specification sheets showing all standard and optional accessories to be supplied; schematic wiring diagrams, dimension drawings, and interconnection diagrams identifying by terminal number each required interconnection between the generator set, the transfer

switch, and the remote annunciator panel if it is included elsewhere in these specifications.

4. Codes and Standards

4.1. The generator set shall be ETL certified to UL 2200 standards or submitted to an independent third party certification process to verify compliance as installed.

4.2. The generator set shall conform to the requirements of the following codes and standards:

4.2.1. CSA C22.2, No. 14-M91 Industrial Control Equipment.

4.2.2. EN50082-2, Electromagnetic Compatibility-Generic Immunity Requirements, Part 2: Industrial.

4.2.3. EN55011, Limits and Methods of Measurement of Radio Interference Characteristics of Industrial, Scientific and Medical Equipment.

4.2.4. IEC8528 part 4, Control Systems for Generator Sets.

4.2.5. IEC Std 61000-2 and 61000-3 for susceptibility, 61000-6 radiated and conducted electromagnetic emissions.

4.2.6. IEEE446 Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications.

4.2.7. NFPA 70, National Electrical Code, Equipment shall be suitable for use in systems in compliance to Article 700, 701, and 702.

4.2.8. NFPA 99, Essential Electrical Systems for Health Care Facilities.

4.2.9. NFPA 110, Emergency and Standby Power Systems. The generator set shall meet all requirements for Level 1 systems.

5. Testing

5.1. To ensure that the equipment has been designed and built to the highest reliability and quality standards, the manufacturer and/or local representative shall be responsible for two separate tests: final production tests and site tests.

5.2. **Final Production Tests**. Each generator set shall be tested under varying loads with guards and exhaust system in place. Tests shall include:

5.2.1 Single-step load pickup

5.2.2. Transient and steady-state governing

5.2.3. Safety shutdown device testing

5.2.4. Voltage regulation

5.2.5. Rated Power @ 0.8 PF

5.2.6. Maximum power

5.2.7. Upon request, a witness test, or a certified test record sent prior to shipment.

5.3. **Site Tests.** The manufacturer's distribution representative shall perform an installation check, startup, and building load test utilizing available site loads. The engineer, regular operators, and the maintenance staff shall be notified of the time and date of the site test. The tests shall include:

5.3.1. Fuel, lubricating oil, and antifreeze shall be checked for conformity to the manufacturer's recommendations, under the environmental conditions present and expected.

5.3.2. Accessories that normally function while the set is standing by shall be checked prior to cranking the engine. These shall include: block heaters, battery chargers, alternator strip heaters, remote annunciators, etc.

5.3.3. Generator set startup under test mode to check for exhaust leaks, path of exhaust gases outside the building, cooling air flow, movement during starting and stopping, vibration during operation, normal and emergency line-to-line voltage and frequency, and phase rotation.

5.3.4. Automatic start by means of a simulated power outage to test remote-automatic starting, transfer of the load, and automatic shutdown. Prior to this test, all transfer switch timers shall be adjusted for proper system coordination. Engine coolant temperature, oil pressure, and battery charge level along with generator set voltage, amperes, and frequency shall be monitored throughout the test.

6. Warranty and Maintenance

6.1. The generator set shall include a standard two year warranty to guarantee against defective material and workmanship in accordance with the manufacturer's published warranty from date of startup. Optional warranties shall be available upon request.

6.2. The generator set manufacturer and its distributor shall maintain a 24-hour parts and service organization. This organization shall regularly engage in maintenance contract programs to perform preventive maintenance and service on equipment similar to that specified. A service agreement shall be available and shall include system operation under simulated operating conditions; adjustment to the generator set, transfer switch, and switchgear controls as required, and certification in the owner's maintenance log of repairs made and function tests performed on all systems.

7. Equipment

7.1. The generator set shall be a Taylor model TG80 with an UCI274C06 alternator. It shall provide 80kW/80 kVA when operating at 120240 volts 1ph., 60 Hz, 1.0 power factor. The generator set shall be capable of a Standby 130°C rating while operating in an ambient condition of less than or equal to 77° F and a maximum elevation of 3279 feet above sea level.

7.2. Motor starting performance and voltage dip determinations shall be based on the complete generator set. The generator set shall be capable of supplying 263SKVA at the specified voltage (120/240 1 ph.) for starting motor loads with a maximum instantaneous voltage dip of 30%, as measured by a digital RMS transient recorder in accordance with IEEE standard 115. Motor starting performance and voltage dip determination that does not account for all components affecting total voltage dip i.e. engine, alternator, voltage regulator and governor will not be acceptable.

7.3. Vibration isolators shall be provided between the engine-alternator and heavy-duty steel base.

8. Engine

8.1. The 5.7L displacement engine shall have the proper HP to deliver 80kW at a governed engine speed of 1800 rpm (engines that operate above 1800 rpm are not acceptable), and shall be equipped with the following:

8.1.1. Electronic isochronous governor capable of 0.5% steady-state frequency regulation.

8.1.2. 24-volt positive-engagement solenoid shift-starting motor.

8.1.3. 70-ampere automatic battery charging alternator with solid-state voltage regulation.

8.1.4. Positive displacement, full-pressure lubrication oil pump, cartridge oil filters, dipstick, and oil drain.

8.1.5. Dry-type replaceable air cleaner elements for normal applications.

8.2. The turbocharged engine shall be fueled by *natural gas.*

8.3. The engine shall have a minimum of 8 cylinders and be liquid-cooled by Unit Mounted Radiator 122°F/50°C.

8.4. The engine shall be EPA certified from the factory, and shall not require a site performance test.

9. Alternator

9.1. The alternator shall be salient-pole, 1 phase sensing, brushless, 2/3-pitch, 4 lead, self-ventilated with drip-proof construction and amortisseur rotor windings and skewed for smooth voltage waveform. The ratings shall meet the NEMA standard (MG1-32.40) temperature rise limits. The insulation shall be class H per UL1446 and the varnish shall be fungus resistant epoxy. Temperature rise of the rotor and stator shall be limited to . The excitation system shall be of brushless construction controlled by a solid-state voltage regulator capable of maintaining voltage within ±1.0% at any constant load from 0% to 100% of rating. The AVR shall be capable of proper operation under severe nonlinear loads and provide individual adjustments for voltage range, stability and volts-per-hertz operations. The AVR shall be protected from the environment by conformal coating. The waveform harmonic distortion shall not exceed 5% total RMS measured line-to-line at full rated load. The TIF factor shall not exceed 50.

9.2. The generator shall be inherently capable of sustaining at least 250% of rated current for at least 10 seconds under a 3-phase symmetrical short circuit without the addition of separate current-support devices.

10. Controller

10.1. The generator shall have a Digital Controller which is a highly advanced integrated genset control system. The controller shall combine rugged construction with microprocessor technology to offer a product that will hold up to any environment and flexible enough to meet they system needs.

10.1.1. The controller shall have front panel navigation keys and large LCD display. It shall incorporate easy to navigate menus for setup and

configuration without the use of additional PLC's or computer connection. All program functions and software shall be NON-proprietary. Any controller(s) provided with proprietary software shall be provided to the owner with all unlocking keys, required hardware and complete writeable software program free of charge.

10.1.2. Features shall include,

a. Generator Metering
b. Engine Metering
c. Genset Control
d. Generator Protection (27, 59, 81O,81U)
e. BESTCOMSPlus (included with every DGC-2020 at no additional cost)
    -Programming and setup software
    -Intuitive and powerful
    -Remote control and monitoring
    -Programmable Logic
    -USB communications
f. Suitable for use on rental gensets with
g. Hi/Lo line sensing
h. Single or three phase sensing override
i. SAE J1939 Engine ECU communications
j. Multilingual capability
k. Remote communications to our RDP-110 Remote Annunciator
l. Battery Backup for Real Time Clock
m. LCD Heater
n. Extremely rugged, fully encapsulated design
o. 16 programmable contact inputs
p. 2 Contact outputs: (1) 30 Adc Gen. Run (1) Programmable 1 Adc rated contracts
q. Wide Ambient Temperature range
r. Additional (8) Programmable 2 Adc contacts (optional)
s. Remote Dial-out and Dial-in capability with Internal Modem (optional)
t. Enhanced Generator Protection 51 and 47
u. Modbus Communications with RS-485
v. Expandable I/O capability via J1939 CANBUS (optional)
w. UL recognized, CSA certified, CE approved
x. HALT (Highly Accelerated Life Tests) tested
y. IP 54 Front Panel rating with integrated gaskets
z. NFPA110 Level Compatible

10.1.3. Description

A. A microprocessor based generator set control shall incorporate advanced technology and features into a user friendly, rugged design. It provides front panel and PC programmability. It can sense engine parameters directly via analog senders, or it can communicate with the engine's ECU using SAE J1939 CANBUS

communications. This device offers programmable inputs and outputs and programmable logic to allow the users easily customize the operation as desired.

B. The controller shall have the capability to be configured to have eight additional output contacts, an internal RS-485, an internal industrial modem for remote communications and dialing out to a pager when the controller detects trouble. Controller shall have optional features for enhanced generator protection.

10.1.4. Functions

A. GENSET PROTECTION:

Standard Protection

Undervoltage (27)
Overvoltage (59)
Underfrequency (81U)
Overfrequency (81O)

Enhanced Protection **(Optional)**

Phase Imbalance (47)
Generator Overcurrent (51**)**

B. All Generator Protection features are programmable as Alarms or Pre-alarms.

a. Engine Alarms (Shutdowns)
b. Low Oil Pressure
c. High Coolant Temperature
d. Low Coolant Temperature
e. Overspeed
f. Overcrank
g. Engine Sender Unit Failure
h. Emergency Stop
i. Battery Charger Failure

C. Pre-Alarms (Warnings)

a. Low Oil Pressure
b. High Coolant Temperature
c. Low Coolant Temperature
e. Battery Overvoltage
f. Weak Battery
g. Battery Charger Failure
h. Engine Sender Unit Failure
i. Engine kW Overload
j. Maintenance Interval Timer
k. Low Coolant Level
l. High Fuel Level
m. Low Fuel Level
n. Fuel Leak Detect

D. All Alarms and Pre-Alarms can be enabled or disabled via the BESTCOMSPlus PC software or the front panel.

E. GENSET METERING

a. Metered generator parameters include voltage, current, Hz, real power (watts), apparent power (VA), and power factor.
b. Metered engine parameters include oil pressure, coolant temperature, RPM, battery voltage, fuel level, engine runtime, and various J1939 supported parameters.

10.1.5. ENGINE CONTROL

A. Cranking Control: Cycle or Continuous (Fully Programmable)
B. Engine Cooldown: Smart Cooldown function saves fuel and engine life.
C. Successful Start Counter: Counts and records successful engine starts

Timers:

a. Engine Cooldown Timer
b. Engine Maintenance Timer
c. Pre-Alarm Time Delay for Weak/Low Battery Voltage
d. Alarm Time Delay for Overspeed
e. Alarm Time Delay for Sender Failure
f. Arming Time Delays after Crank Disconnect:
-Low Oil Pressure
-High Coolant Temperature
g. Pre-Crank Delay
h. Continuous or Cycle Cranking Time Delay

D. Provide Keyed cranking panel that bypasses the controller and safeties to crank the engine in the event the controller fails.

10.1.6 EVENT RECORDING

A. The DGC has an event recorder that provides a record of alarms, pre-alarms, engine starts, engine runtime loaded, engine runtime unloaded, last run date, and many other events that are all date and time stamped to help the user determine the cause and effect of issues related to the generator set.

B. BATTERY BACKUP FOR REAL TIME CLOCK

A ten-year (typical life) lithium battery is used to provide long term maintenance for the real time clock setting. This battery is serviceable by removing the rear cover. All settings, programming, and even records are saved in non-volatile memory and do not require battery backup.

11. Accessories

11.1. **Battery Charger.** A 10-ampere automatic float to equalize battery charger with LCD Display, LED Indicators, meters and NFPA-110 alarm contacts for Remote Alarm Annunciation.

11.2. **Batteries, Rack and Cables.** Battery (950CCA), rack and battery cables capable of holding the manufacturer's recommended batteries shall be supplied.

11.3. **Block Heater.** The 120V, 1500W block heater shall be thermostatically controlled and sized to maintain manufacturers recommended engine coolant temperature to meet the start-up requirements of NFPA 99 and NFPA 110, Level 1.

11.4. **Circuit Breaker.** A UL 489 listed 400Amp Frame/350Amp Trip, 100% rated line circuit breaker, Electronic Trip (LSI), generator-mounted with load side lugs and auxiliary contacts.

11.5. **Critical Silencer.** The engine exhaust silencer shall be temperature and rust resistant, and rated for critical applications. The silencer will reduce total engine exhaust noise by 25-35 db(A).

11.6. **Flex Exhaust Tube.** The exhaust piping shall be gas proof, seamless, stainless steel, flexible exhaust bellows with threaded NPT connection.

11.7. **Flexible Fuel Line.** The flexible fuel line shall have a fitting for the engine inlet and a threaded pipe fitting for connection to the stationary piping

11.8. **Standard Air Cleaner.** The air cleaner shall provide engine air filtration which meets the engine manufacturer's specifications under typical operating conditions.

11.9 **Remote Annunciator.** Flush Mount Remote Annunciator meeting NFPA-110 requirements.

11.10 **Remote Emergency Stop Switch.** Break-Glass Type, provided loose for mounting in location specified by engineer.

11.11 **Oil and Coolant Drains with Valves.** Piped to edge of skid

11.12 **Manual Key Bypass Switch.** Provide manual key override bypass switch that allows starting of the generator manually in the event of control systems failure.

12. Sound Attenuated Wind Rated Aluminum Weather Enclosure w/ Internal Critical Silencer

12.1. All enclosures are to be constructed from heavy duty Aluminum

12.2. The enclosure shall be finish coated with powder baked paint for superior finish, durability, and appearance. Enclosures will be finished in the manufacturer's standard color.

12.3. The enclosures must allow the generator set to operate at full load in an ambient temperature of 40 - 45°C with no additional derating of the electrical output.

12.4. Enclosures must be equipped with sufficient side and end doors to allow access for operation, inspection, and service of the unit and all options. Minimum requirements are two doors per side. When the generator set controller faces the rear of the generator set, an additional rear facing door is required. Access to the controller and main line circuit breaker must meet the requirements of the National Electric Code.

12.5. Doors must be hinged with stainless steel hinges and hardware and be removable.

12.6. Doors must be equipped with lockable latches. Locks must be keyed alike.

12.7. A duct between the radiator and air outlet must be provided to prevent re-circulation of hot air.

12.8. The complete exhaust system shall be internal to the enclosure

12.9 A sound attenuated weather housing shall be provided. The housing shall be constructed of 14 gauge Aluminum with 1” UL-94 Sound Attenuating Foam and have a **Wind Rating of 186 MPH**.

SECTION 16613 – AUTOMATIC TRANSFER SWITCHES

PART 1 GENERAL

1.01 Scope

Furnish and install **Two** automatic transfer switches (3ATS) **400Amp, 2 pole, 3 Wire, 240VAC**, **NEMA 3R** (outdoors). Each automatic transfer shall consist of a mechanically held power transfer switch unit and a microprocessor controller, interconnected to provide complete automatic operation. All transfer switches and control panels shall be the product of the same manufacturer.

1.02 Acceptable Manufacturers

Automatic transfer switches shall be ASCO Series 300 (3ATS). Any alternate shall be submitted to the consulting engineer in writing at least 10 days prior to bid. Each alternate bid must list any deviations from this specification.

1.03 Codes and Standards

The automatic transfer switches and accessories shall conform to the requirements of:

A. UL 1008 - Standard for Automatic Transfer Switches

B. CSA C22.2 No.178 – 1978

C. NFPA 70 - National Electrical Code

D. NFPA 99 – Health Care Facilities

E. NFPA 110 - Emergency and Standby Power Systems

F. IEEE Standard 446 - IEEE Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications

G. NEMA Standard ICS10-2005 (formerly ICS2-447) - AC Automatic Transfer Switches

H. NEC Articles 700, 701, 702

I. International Standards Organization ISO 9001: 2008

J. IEC 60947 – 6 – 1

PART 2 PRODUCTS

2.01 Mechanically Held Transfer Switch

A. The transfer switch unit shall be electrically operated and mechanically held. The electrical operator shall be a single-solenoid mechanism, momentarily energized. Main operators which include over current disconnect devices will not be accepted. The switch shall be mechanically interlocked to ensure only one of two possible positions, normal or emergency.

B. The switch shall be positively locked and unaffected by momentary outages so that contact pressure is maintained at a constant value and temperature rise at the contacts is minimized for maximum reliability and operating life.

C. All main contacts shall be silver composition. Switches rated 800 amperes and above shall have segmented blow-on construction for high withstand current capability and be protected by separate arcing contacts.

D. Inspection of all contacts shall be possible from the front of the switch without disassembly of operating linkages and without disconnection of power conductors. A manual operating handle shall be provided for maintenance purposes. The handle shall permit the operator to manually stop the contacts at any point throughout their entire travel to inspect and service the contacts when required.

E. Designs utilizing components of molded-case circuit breakers, contactors, or parts thereof which are not intended for continuous duty, repetitive switching or transfer between two active power sources are not acceptable.

F. Where neutral conductors must be switched, the ATS shall be provided with fully-rated neutral transfer contacts.

G. Where neutral conductors are to be solidly connected, a neutral terminal plate with fully-rated AL-CU pressure connectors shall be provided.

2.02 Group 'G' Controller with Integrated User Interface Panel

A. The controller shall be connected to the transfer switch by an interconnecting wiring harness. The harness shall include a keyed disconnect plug to enable the controller to be disconnected from the transfer switch for routine maintenance.

B. The controller shall direct the operation of the transfer switch. The controller's sensing and logic shall be controlled by a built-in microprocessor for maximum reliability, minimum maintenance, inherent serial communications capability, and the ability to communicate via the Ethernet through optional communications module

C. A single controller shall provide single and three phase capability for maximum application flexibility and minimal spare part requirements. Voltage sensing shall be true RMS type and shall be accurate to ± 1% of nominal voltage.
F
requency sensing shall be accurate to ± 0.1Hz. Time delay settings shall be accurate to ± 0.5% of the full scale value of the time delay. The panel shall be capable of operating over a temperature range of -20 to + 70 degrees C, and storage from -55 to + 85 degrees C.

D. The controller shall be enclosed with a protective cover and be mounted separate from the transfer switch unit for safety and ease of maintenance. Sensing and control logic shall be provided on printed circuit boards.

E. The controller shall meet or exceed the requirements for Electromagnetic Compatibility (EMC) as follows:

1. IEC 60947 – 6 – 1 Multiple Function Equipment Transfer Switching Equipment. 61000-4 Testing And Measurement Techniques - Overview
   a. IEC 61000 – 4 - 2 Electrostatic Discharge Immunity
   b. IEC 61000 – 4 - 3 Radiated RF Field Immunity
   c. IEC 61000 – 4 - 4 Electrical Fast Transient/Burst Immunity
   d. IEC 61000 – 4 - 5 Surge Immunity
   e. IEC 61000 – 4 – 6 Conducted RF Immunity
2. CISPR 11 – Conducted RF Emissions and Radiated RF Emissions

2.03 Enclosure

A. The 3ATS shall be furnished in a NEMA type 3R enclosure unless otherwise shown on the plans.

B. Provide strip heater with thermostat for Type 3R enclosure requirements.

C. Controller shall be mounted on, visible, and operational through enclosure door.

PART 3 OPERATIONS

3.01 Controller Display and Keypad

A. A 128*64 graphical LCD display and keypad shall be an integral part of the controller for viewing all available data and setting desired operational parameters. Operational parameters shall also be available for viewing and limited control through communications port. The following parameters shall only be adjustable via DIP switches on the controller.

1. Nominal line voltage and frequency
2. Single or three phase sensing on normal
3. Transfer operating mode configuration, (open transition, or delayed transition)

All instructions and controller settings shall be easily accessible, readable and accomplished without the use of codes, calculations, or instruction manuals.

3.02 Voltage and Frequency Sensing

A. Voltage and frequency on both the normal and emergency sources (as noted below) shall be continuously monitored, with the following pickup ,dropout, and trip settings capabilities (values shown as % of nominal unless otherwise specified.

Parameter	Sources	Dropout/Trip	Pickup/Reset
Undervoltage	N & E	70 to 98%	85 to 100%
Overvoltage	N & E	102 to116%	2% below trip
Underfrequency	N & E	85 to 98%	86 to 100%
Overfrequency	N & E	101 to 111%	2% below trip

B. Repetitive accuracy of all settings shall be within 1% at +25C

C. Voltage and frequency settings shall be field adjustable in 1% increments either locally with the display and keypad or remotely via serial communications port access.

D. Source status screens shall be provided for both normal & emergency to provide digital readout of voltage and frequency. *Note: Single phase sensing on emergency*

E. The backlit 128*64 graphical display shall have multiple language capability. Languages can be selected from the user interface.

3.03 Time Delays

A. A time delay shall be provided to override momentary normal source outages and delay all transfer and engine starting signals, adjustable 0 to 6 seconds. It shall be possible to bypass the time delay from the controller user interface.

B. A time delay shall be provided on transfer to emergency, adjustable from 0 to 60 minutes 59 seconds for controlled timing of transfer of loads to emergency. It shall be possible to bypass the time delay from the controller user interface.

C. A generator stabilization time delay shall be provided after transfer to emergency adjustable 0 or 4 seconds.

D. A time delay shall be provided on retransfer to normal, adjustable 0 to 9 hours 59 minutes 59 seconds. Time delay shall be automatically bypassed if emergency source fails and normal source is acceptable.

E. A cooldown time delay shall be provided on shutdown of engine generator, Adjustable 0 to 60 minutes 59 seconds.

F. All adjustable time delays shall be field adjustable without the use of special tools.

G. A time delay activated output signal shall also be provided to drive an external relay(s) for selective load disconnect control. The controller shall have the ability to activate an adjustable 0 to 5 minutes 59 seconds time delay in any of the following modes:

1. Prior to transfer only.
2. Prior to and after transfer.
3. Normal to emergency only.
4. Emergency to normal only.

5. Normal to emergency and emergency to normal.

6. All transfer conditions or only when both sources are available.

H. In the event that the alternate source is not accepted within the configured Failure to Accept time delay, the common alert indication shall become active.

I. The controller shall also include the following built-in time delay for delayed transition operation.

1. A time delay for the load disconnect position for delayed transition operation adjustable 0 to 5 minutes 59 seconds.

3.04 Additional Features

A. The user interface shall be provided with test/reset modes. The test mode will simulate a normal source failure. The reset mode shall bypass the time delays on either transfer to emergency or retransfer to normal.

B. A set of contacts rated 5 amps, 30 VDC shall be provided for a low-voltage engine start signal. The start signal shall prevent dry cranking of the engine by requiring the generator set to reach proper output, and run for the duration of the cool down. setting, regardless of whether the normal source restores before the load is transferred.

C. Auxiliary contacts, rated 10 amps, 250 VAC shall be provided consisting of one contact, closed when the ATS is connected to the normal source and one contact closed when the ATS is connected to the emergency source.

D. A single alarm indication shall light up the alert indicator and de – energize the configured common alarm output relay for external monitoring.

E. LED indicating lights shall be provided; one to indicate when the ATS is connected to the normal source (green) and one to indicate when the ATS is connected to the emergency source (red).

F. LED indicating lights shall be provided and energized by controller outputs. The lights shall provide true source availability of the normal (green) and emergency (red) source, as determined by the voltage sensing trip and reset settings for each source.

G. LED indicating light shall be provided to indicate switch not in automatic mode (manual); and blinking (amber) to indicate transfer inhibit.

H. LED indicating light shall be provided to indicate any alarm condition or active time delay (red).

The following features shall be built – in to the controller, but capable of being activated through keypad programming or the serial port only when required by the user:

I. Provide the ability to select “commit/no commit to transfer” to determine whether the load should be transferred to the emergency generator if the normal source restores before the generator is ready to accept the load.

J. A variable window inphase monitor shall be provided in the controller. The monitor shall control transfer so that motor load inrush currents do not exceed normal starting currents, and shall not require external control of power sources. The inphase monitor shall be specifically designed for and be the product of the ATS manufacturer. The inphase monitor shall be equal to ASCO feature 27.

K. An engine generator exercising timer shall be provided to configure weekly and bi- weekly automatic testing of an engine generator set with or without load for 20 minutes fixed. It shall be capable of being configured to indicate a day of the week, and time weekly testing should occur.

The following feature shall be built – into the controller, but capable of being activated through keypad programming, communications interface port, or additional hardware.

L. Terminals shall be provided for a remote contact to signal the ATS to transfer to emergency. This inhibit signal can be enabled through the keypad or serial port.

M. System Status - The controller LCD display shall include a "System Status" screen which shall be readily accessible from any point in the menu by depressing the "ESC" key. This screen shall display a clear description of the active operating sequences and switch position. For example,

Normal Failed
Load on Normal
TD Normal
to Emerg
2min15s

Controllers that require multiple screens to determine system status or display "coded" system status messages, which must be explained by references in the operator's manual are not permissible.

N. Self Diagnostics – The controller shall contain a diagnostic screen for the purpose of detecting system errors. This screen shall provide information on the status input signals to the controller which may be preventing load transfer commands from being completed.

O. Communications Interface – The controller shall be capable of interfacing, through an optional serial communication port with a network of transfer switches, locally (up to 4000 ft.). Standard software specific for transfer switch applications shall be available by the transfer switch manufacturer. This software shall allow for the monitoring, control, and setup of parameters.

P. Data Logging **–** The controller shall have the ability to log data and to maintain the last 99 events, even in the event of total power loss. The following events shall be time and date stamped and maintained in a non – volatile memory.

1. Event Logging

    1. Data and time and reason for transfer normal to emergency
    2. Data and time and reason for transfer emergency to normal

3. Data and time and reason for engine start
4. Data and time engine stopped
5. Data and time emergency source available
6. Data and time emergency source not available

2. Statistical Data

1. Total number of transfers
2. Total number of transfers due to source failure
3. Total number of day's controller is energized
4. Total number of hours both normal and emergency sources are Available
5. Total time load is connected to normal
6. Total time load is connected to emergency
7. Last engine start
8. Last engine start up time
9. Input and output status

4.01 Optional Features

A. Accessory Package - An accessory bundle shall be provided that includes:

1. A fully programmable engine exerciser with seven independent routines to exercise the engine generator, with or without load on a daily weekly, bi – weekly, or monthly basis.

2. Event log display that shows event number, time and date of events, event type, and reason (if applicable). A minimum of 300 events shall be stored.

3. RS – 485 communications port enabled.

4. Common alarm output contact.

(This feature shall be equal to ASCO accessory 11BE, and shall be capable of being activated for existing switches through optional accessory dongle).

5.01 Section Deleted

PART 6 ADDITIONAL REQUIREMENTS

6.01 Withstand and Closing Ratings

A. The ATS shall be rated to close on and withstand the available RMS symmetrical short circuit current at the ATS terminals with the type of overcurrent protection shown on the plans. WCR ATS ratings shall be as follows when used with specific circuit breakers:

ATS Size	Withstand & Closing Rating MCCB	W/CLF

	(480v/60hz)	
30	22,000A	100,000
70 - 200	22,000A	200,000
230	25,000A	100,000
260 – 400	42,000A	200,000
600	50,000A	200,000
800 – 1200	65,000A	200,000
1600 – 2000	85,000A	200,000
2600 – 3000	100,000A	200,000

6.02 Tests and Certification

A. The complete 3ATS shall be factory tested to ensure proper operation of the individual components and correct overall sequence of operation and to ensure that the operating transfer time, voltage, frequency and time delay settings are in compliance with the specification requirements.

B. Upon request, the manufacturer shall provide a notarized letter certifying compliance with all of the requirements of this specification including compliance with the above codes and standards, and withstand and closing ratings. The certification shall identify, by serial number(s), the equipment involved. No exceptions to the specifications, other than those stipulated at the time of the submittal, shall be included in the certification.

C. The ATS manufacturer shall be certified to ISO 9001: 2008 International Quality Standard and the manufacturer shall have third party certification verifying quality assurance in design/development, production, installation and servicing in accordance with ISO 9001: 2008.

6.03 Service Representation

A. The ATS manufacturer shall maintain a national service organization of company-employed personnel located throughout the contiguous United States. The service center's personnel must be factory trained and must be on call 24 hours a day, 365 days a year.

B. The manufacturer shall maintain records of switch shipments, by serial number, for a minimum of 20 years.

C. For ease of maintenance, the transfer switch nameplate shall include drawing numbers and serviceable part numbers.

SECTION 16700 - SURGE PROTECTION FOR LOW-VOLTAGE ELECTRICAL POWER CIRCUITS

I. GENERAL

1.01 RELATED SECTIONS

A. The Contractor shall furnish and install the Transient Voltage Surge Suppression (TVSS) equipment having the electrical characteristics, ratings and modifications as specified herein and as shown on the contract drawings. Refer to related sections for surge requirements in:

1.02 RELATED SECTIONS

a) Section 16300 -- Panelboards

1.03 REFERENCES.

The TVSS units and all components shall be designed, manufactured and tested in accordance with the latest applicable UL Listed standards (UL 1449, 2nd Edition), UL 1283 and CSA certified per CSA 22.2

1.04 SUBMITTALS

A. The following information shall be submitted to the Engineer:

1. Provide verification that the TVSS device complies with the required UL 1449 2nd Edition and CSA approvals.

2. Provide actual let through voltage test data in the form of oscillograph results for the ANSI/IEEE C62.41 Category C3 & C1 (combination wave) and B3 (ringwave) tested in accordance with ANSI/IEEE C62.45.

3. Provide spectrum analysis of each unit based on MIL-STD-220A test procedures between 50 kHz and 200 kHz verifying the device's noise attenuation exceeds 41 dB at 100 kHz.

4. Provide test report from a recognized independent testing laboratory verifying the suppressor components can survive published surge current rating on both a per mode and per phase basis using the IEEE C62.41, 8 x 20 microsecond current wave. Note that test data on individual module is not accepted.

B. Submit five (5) copies of the above information.

1.05 SUBMITTALS – FOR INFORMATION:

When requested by the Engineer the following product information shall be submitted to the engineer:

a) UL 1449 Listing classifications, and clamping voltage rating for each mode of protection.
b) ANSI/IEEE C62.41 AND C62.45 Category C3 clamping voltage.
c) Sequential surge survivability per ANSI/IEEE C62.45.
d) Dimensions and weight
e) Recommended connection wiring diagram

1.06 QUALIFICATIONS

A. Manufacturer must have a minimum of five years (in U.S.) experience in producing TVSS systems.

B. TVSS devices and accessories shall be obtained through one manufacturer.

C. Other manufacturers not listed in this document may be considered by the engineer/architect at least 14 days prior to bid. The specifications of the product listed in 1.05 “SUBMITTALS- FOR INFORMATION” shall be highlighted.

1.07 DELIVERY, STORAGE AND HANDLING

A. Equipment shall be handled and stored in accordance with manufacturer’s instructions. One (1) copy of these Shall be included with the equipment at time of shipment.

1.08 OPERATION AND MAINTENANCE MANUALS

A. Five (5) copies of the equipment operation and maintenance manuals shall be provided.

B. Operation and maintenance manuals shall include the following information:

1. Instruction books and/or leaflets
2. Recommended renewal parts list

1.10 EXTRA MATERIALS:

A. Furnish replaceable protection modules for service entrance unit with labeled protective covering for storage.

II. PRODUCTS

2.01 MANUFACTURERS

A. Cutler-Hammer, Square D, Advanced Protection Technologies (APT), Surge Suppression Inc.

2.02 VOLTAGE SURGE SUPPRESSION – GENERAL

A. Electrical Requirements

1. Unit Operating Voltage -- Refer to drawings for operating voltage and unit configuration.

2. Maximum Continuous Operating Voltage (MCOV) -- The MCOV shall be greater than 115% of the nominal system operating voltage.

3. Protection Modes -- For a wye configured system, the device must have directly connected suppression elements between line-neutral (L-N), line-ground (L-G), and neutral-ground (N-G). For a delta configured system, the device must have suppression elements between line to line (L-L) and line to ground (L-G).

4. UL 1449 2nd Edition SVR -- The maximum UL 1449 2nd Edition SVR for the device must not exceed the following:

Modes	208Y/120	480Y/277	600Y/347
L-N; L-G; N-G	500 V	900 V	1000 V
L-L	900 V	1500 V	1800 V

5. ANSI/IEEE Cat C3 Let Through Voltage -- The let through voltage based on IEEE C62.41 and C62.45 recommended procedures for Category C3 surges (20 kV, 10 kA) shall be less than:

Modes	208Y/120	480Y/277	600Y/347
L-N	910 V	1070 V	1300 V

6. ANSI/IEEE Cat. B3 Let Through Voltage -- Let through voltage based on IEEE C62.41 and C62.45 recommended procedures for the ANSI/IEEE Cat. B3 ringwave (6 kV, 5000 amps) shall be less than:

Modes	208Y/120	480Y/277	600Y/347
L-N	375 V	510 V	300 V

B. TVSS Design

1. Balanced Suppression Platform -- The surge current shall be equally distributed to all MOV components to ensure equal stressing and maximum performance. The surge suppression platform must provide equal impedance paths to each matched MOV. Designs incorporating TVSS modules shall not be acceptable.

2. Electrical Noise Filter -- Each unit shall include a high-performance EMI/RFI noise rejection filter. Noise attenuation for electric line noise shall be 41 dB at 100 kHz using the MIL-STD-220A insertion loss test method. The unit shall be complimentary listed to UL 1283. Products not able to demonstrate noise attenuation of 41 dB @ 100 kHz shall be rejected.

3. Internal Connections -- No plug-in component modules shall be used as surge current conductors. All internal components shall be hardwired with connections utilizing low impedance conductors and compression fittings.

4. Safety and Diagnostic Monitoring -- Each unit shall be equipped with 200 kAIC internal fuses. Each unit shall provide the following three levels of monitoring:

   a) Continuous monitoring of fusing system
   b) Thermal detection circuit shall monitor for overheating in all modes due to thermal runaway.

   c) A green/red solid state indicator light shall be provided on each phase. The absence of a green light and the presence of a red light, shall indicate which phase(s) have been damaged. Fault detection will activate a flashing trouble light. Units which can not detect open-circuit damage, thermal conditions and over current will not be accepted.

5. Warranty -- The manufacturer shall provide a full ten (10) year warranty from the date of shipment against any TVSS part failure when installed in compliance with manufacturer's written instructions and any applicable national or local electric code.

2.03 SYSTEM APPLICATION

A. The TVSS applications covered under this section include distribution and branch panel locations, bus plugs, motor control centers (MCC), switchgear, and switchboard assemblies.

B. Surge Current Capacity -- The minimum total surge current 8 x 20 microsecond waveform that the device is capable of withstanding shall be as shown in the following table:

Application	Min. Surge Current (per mode)
Service Entrance (Switchboards Switchgear, MCC Main Entrance)	120 kA
Distribution Panelboards	80 kA
High Exposure Roof Top Locations	80 kA
Branch Locations (Panelboards, MCC's, Busway)	40 kA

2.04 Accessories

A. Push to test feature to verify operational integrity.

B. Form C dry contacts one NO, one NC for remote status monitoring.

2.05 Enclosures

A. All enclosed equipment shall have NEMA 1 general purpose enclosures, unless otherwise noted. Provide enclosures suitable for locations as indicated on the drawings and as described below:

1. NEMA 1 surface or flush-mounted general purpose enclosures primarily intended for indoor use
2. NEMA 12 dust-tight enclosures intended for indoor use primarily to provide protection against circulating dust, falling dirt and dripping non-corrosive liquids (Panelboards Only)
3. NEMA 3R rainproof enclosures intended for outdoor use primarily to provide protection against rain, sleet and damage from external ice formation
4. NEMA 4 watertight stainless steel intended for indoor or outdoor use primarily to provide protection against windblown dust and rain, splashing rain, hose-directed water, and damage from external ice formation. (Side Mounted Units Only)

III. EXECUTION

3.01 Examination

3.02 Factory testing

A. Standard factory tests shall be performed on the equipment under this section. All tests shall be in accordance with the latest version of NEMA and UL standards.

3.03 Installation

A. The Contractors shall install all equipment per the manufacturer's recommendations and the contract drawings.

B. Surge protection devices shall be installed and connected before the service entrance is connected or energized.

C. Existing utilities shall not be interrupted without written permission from project's architect.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

Florida Building Code, 8th Edition (2023) - Energy Conservation

EnergyGauge Summit® Fla/Com-2023, Effective Date: Dec 31, 2023

C407: FBC Total Building Performance Compliance Option

Compliance applying the requirements of Sections C402.5, C403.2, C404,C405.2, C405.4, C405.5, C407 and C408. The building energy cost shall be equal to or less than 85 percent of the standard reference design building.

Check List

Applications for compliance with the Florida Building Code, Energy Conservation shall include:

- ☑ The full compliance report generated by the software that contains the project summary, compliance summary, certifications and detailed component compliance reports.
- ☑ The compliance report must include the full input report generated by the software as contigous part of the compliance report.
- ☑ Boxes appropriately checked in the Mandatory Section of the complaince report.

PROJECT SUMMARY

Short Desc:	2024-075 Trinity UMC	**Description:**	Trinity United Methodist Church
Owner:			
Address1:	4400 W 19th Street	**City:**	Panama City
Address2:		**State:**	FL
		Zip:	0
Type:	Religious Building	**Class:**	New Finished building
Jurisdiction:	BAY COUNTY, BAY COUNTY, FL (131000)		
Conditioned Area:	2420 SF	**Conditioned & UnConditioned Area:**	2420 SF
No of Stories:	1	**Area entered from Plans**	2500 SF
Permit No:	32405	**Max Tonnage**	5
		If different, write in:	_____

Compliance Summary

Component	Design	Criteria	Result
Gross Energy Cost (in $)	1398.00	1634.00	**PASSED**
LIGHTING CONTROLS			**PASSES**
EXTERNAL LIGHTING			**PASSES**
HVAC SYSTEM			**PASSES**
PLANT			**No Entry**
WATER HEATING SYSTEMS			**Not Checked**
PIPING SYSTEMS			**PASSES**
Met all required compliance from Check List?			**Yes**/**No**/**NA**

IMPORTANT MESSAGE
Info 5009 -- -- -- An input report of this design building must be submitted along with this Compliance Report

CERTIFICATIONS

I hereby certify that the plans and specifications covered by this calculation are in compliance with the Florida Energy Code

Prepared By: Ian Bernander

Date: 2/28/2025

Building Official: _____

Date: _____

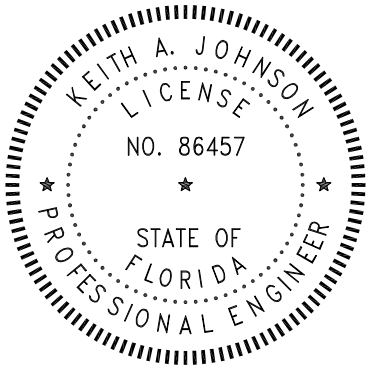
I certify that this building is in compliance with the FLorida Energy Efficiency Code

Owner Agent: _____ Date: _____

If Required by Florida law, I hereby certify (*) that the system design is in compliance with the Florida Energy Efficiency Code

Architect:	Jennifer P Jones	Reg No: RA103362 Signature_____
Electrical Designer:	Anthony Davis	Reg No: 57419 Signature_____
Lighting Designer:	Anthony Davis	Reg No: 57419 Signature_____
Mechanical Designer:	Keith Johnson	Reg No: 86457 Signature_____
Plumbing Designer:	Keith Johnson	Reg No: 86457 Signature_____

(*) Signature is required where Florida Law requires design to be performed by registered design professionals per C103.1.1.1.2



Project: 2024-075 Trinity UMC
Title: Trinity United Methodist Church Addition
Type: Religious Building
(WEA File: FL_PANAMA_CITY_BAY_CO.tm3)

Building End Uses

	1) Proposed	2) Baseline
Total	***89.10***	***122.60***
	$1,398	***$1,923***
ELECTRICITY(MBtu/kWh/$)	89.10	122.60
	26136	35940
	$1,398	***$1,923***
AREA LIGHTS	10.80	21.50
	3170	6307
	$170	***$337***
MISC EQUIPMT	31.40	31.40
	9190	9190
	$492	***$492***
PUMPS & MISC	0.20	0.20
	68	72
	$4	***$4***
SPACE COOL	27.50	29.30
	8064	8575
	$431	***$459***
SPACE HEAT	5.20	5.80
	1537	1712
	$82	***$92***
VENT FANS	14.00	34.40
	4107	10084
	$220	***$539***

Credits Applied: None
Passing Criteria = 1634
Design (including any credits) = 1398
Passing requires Proposed Building cost to be at most 85% of Baseline cost. This Proposed Building is at 72.7%

PASSES

Project: 2024-075 Trinity UMC
Title: Trinity United Methodist Church Addition
Type: Religious Building
(WEA File: FL_PANAMA_CITY_BAY_CO.tm3)

External Lighting Compliance

Description	Category	Tradable?	Allowance (W/Unit)	Area or Length or No. of Units (Sqft or ft)	ELPA (W)	CLP (W)
Ext Light 1	Building facades (by linear foot)	No	3.75	177.0	664	216

Tradable Surfaces: 0 (W) Allowance for Tradable: 500 (W) **PASSES**
All External Lighting: 216 (W)
Complicance check includes a excess/Base allowance of 500.00(W)

Lighting Controls Compliance

Acronym	ID	Description	Area (sq.ft)	Compliance
101 Meeting	**15**	**Zo0Sp1 (Conference/meeting (Multiple Functions))**	**480**	COMPLIANCE: PASSES REQUIRED: All of |1|; one of |2|3|; one of |8| CONTROLS IN SPACE: 1-Manual (Local Control) 2-Occupancy Sensor - Manual ON only 8-Occupant Sensor Auto Full OFF
102 Office	**17**	**Zo0Sp2 (Office - Enclosed)**	**100**	COMPLIANCE: PASSES REQUIRED: All of |1|; one of |2|3|; one of |8| CONTROLS IN SPACE: 1-Manual (Local Control) 2-Occupancy Sensor - Manual ON only 8-Occupant Sensor Auto Full OFF
103 Office	**17**	**Zo0Sp2 (Office - Enclosed)**	**100**	COMPLIANCE: PASSES REQUIRED: All of |1|; one of |2|3|; one of |8| CONTROLS IN SPACE: 1-Manual (Local Control) 2-Occupancy Sensor - Manual ON only 8-Occupant Sensor Auto Full OFF
104 Mech	**1**	**Zo0Sp4 (Electrical Mechanical Equipment Room - General)**	**50**	COMPLIANCE: PASSES REQUIRED: All of |1|8|; one of |2|3| CONTROLS IN SPACE: 1-Manual (Local Control) 2-Occupancy Sensor - Manual ON only 8-Occupant Sensor Auto Full OFF
105 Shower	**6**	**Zo0Sp5 (Toilet and Washroom)**	**60**	COMPLIANCE: PASSES REQUIRED: All of |3|; one of |8| CONTROLS IN SPACE: 1-Manual (Local Control) 3-Occupant Sensor (50%) 8-Occupant Sensor Auto Full OFF

106 Shower	**6**	**Zo0Sp6 (Toilet and Washroom)**	**50** COMPLIANCE: PASSES REQUIRED: All of |3|; one of |8| CONTROLS IN SPACE: 1-Manual (Local Control) 3-Occupant Sensor (50%) 8-Occupant Sensor Auto Full OFF
107 Laundry	**2**	**Zo0Sp7 (Storage & Warehouse - Inactive Storage)**	**60** COMPLIANCE: PASSES REQUIRED: All of |1|7|; one of |9| CONTROLS IN SPACE: 1-Manual (Local Control) 7-Occupant Sensor Auto OFF (Full or Partial) 9-Time-Switch: Auto Full Off or Scheduled Off
108 RR	**6**	**Zo0Sp8 (Toilet and Washroom)**	**40** COMPLIANCE: PASSES REQUIRED: All of |3|; one of |8| CONTROLS IN SPACE: 1-Manual (Local Control) 3-Occupant Sensor (50%) 8-Occupant Sensor Auto Full OFF
109 RR	**6**	**Zo0Sp9 (Toilet and Washroom)**	**40** COMPLIANCE: PASSES REQUIRED: All of |3|; one of |8| CONTROLS IN SPACE: 1-Manual (Local Control) 3-Occupant Sensor (50%) 8-Occupant Sensor Auto Full OFF
111 Office	**17**	**Zo0Sp10 (Office - Enclosed)**	**140** COMPLIANCE: PASSES REQUIRED: All of |1|; one of |2|3|; one of |8| CONTROLS IN SPACE: 1-Manual (Local Control) 2-Occupancy Sensor - Manual ON only 8-Occupant Sensor Auto Full OFF
112 Office	**17**	**Zo0Sp10 (Office - Enclosed)**	**120** COMPLIANCE: PASSES REQUIRED: All of |1|; one of |2|3|; one of |8| CONTROLS IN SPACE: 1-Manual (Local Control) 2-Occupancy Sensor - Manual ON only 8-Occupant Sensor Auto Full OFF

113 Office	**17**	**Zo0Sp10 (Office - Enclosed)**	**120**	COMPLIANCE: PASSES REQUIRED: All of |1|; one of |2|3|; one of |8| CONTROLS IN SPACE: 1-Manual (Local Control) 2-Occupancy Sensor - Manual ON only 8-Occupant Sensor Auto Full OFF
114 Shared Office	**17**	**Zo0Sp10 (Office - Enclosed)**	**110**	COMPLIANCE: PASSES REQUIRED: All of |1|; one of |2|3|; one of |8| CONTROLS IN SPACE: 1-Manual (Local Control) 2-Occupancy Sensor - Manual ON only 8-Occupant Sensor Auto Full OFF
115 Shared Office	**17**	**Zo0Sp10 (Office - Enclosed)**	**150**	COMPLIANCE: PASSES REQUIRED: All of |1|; one of |2|3|; one of |8| CONTROLS IN SPACE: 1-Manual (Local Control) 2-Occupancy Sensor - Manual ON only 8-Occupant Sensor Auto Full OFF
118 Kitchen	**7**	**Zo0Sp1 (Food Service - Kitchen)**	**720**	COMPLIANCE: PASSES REQUIRED: All of |1|4|; one of |2|; one of |9| CONTROLS IN SPACE: 1-Manual (Local Control) 2-Occupancy Sensor - Manual ON only 4-Light Reduction (30%-70%) 9-Time-Switch: Auto Full Off or Scheduled Off
116 Storage	**2**	**Zo0Sp2 (Storage & Warehouse - Inactive Storage)**	**40**	COMPLIANCE: PASSES REQUIRED: All of |1|7|; one of |9| CONTROLS IN SPACE: 1-Manual (Local Control) 7-Occupant Sensor Auto OFF (Full or Partial) 9-Time-Switch: Auto Full Off or Scheduled Off

117 Storage	**2 Zo0Sp2 (Storage & Warehouse - Inactive Storage)**	**40**	COMPLIANCE: PASSES REQUIRED: All of |1|7|; one of |9| CONTROLS IN SPACE: 1-Manual (Local Control) 7-Occupant Sensor Auto OFF (Full or Partial) 9-Time-Switch: Auto Full Off or Scheduled Off
			PASSES

Project: 2024-075 Trinity UMC
Title: Trinity United Methodist Church Addition
Type: Religious Building
(WEA File: FL_PANAMA_CITY_BAY_CO.tm3)

System Report Compliance

AHU-4 **System 1** **Constant Volume Air Cooled Split System < 65000 Btu/hr** **No. of Units 1**

Component	Category	Capacity	Eff Design	Eff Criteria	Integrated Eff-Design	Integrated Eff-Criteria	Comp-liance
Cooling System	Air Conditioners Air Cooled Split System 45000 - 65000 Btu/h Cooling Capacity	60000	14.30	13.80	8.00		**PASSES**
Heating System	Heat Pumps Air Cooled (Heating Mode) Split System < 65000 Btu/h Cooling Capacity	52500	7.50	7.50			**PASSES**
Air Handling System -Supply	Air Handler (Supply) - Constant Volume	1750	0.32	0.82			**PASSES**

AHU-5 **System 2** **Constant Volume Air Cooled Split System < 65000 Btu/hr** **No. of Units 1**

Component	Category	Capacity	Eff Design	Eff Criteria	Integrated Eff-Design	Integrated Eff-Criteria	Comp-liance
Cooling System	Air Conditioners Air Cooled Split System < 45000 Btu/h Cooling Capacity	18000	15.20	14.30	8.00		**PASSES**
Heating System	Heat Pumps Air Cooled (Heating Mode) Split System < 65000 Btu/h Cooling Capacity	17800	7.50	7.50			**PASSES**
Air Handling System -Supply	Air Handler (Supply) - Constant Volume	605	0.62	0.82			**PASSES**

PASSES

Plant Compliance

Description	Installed No	Size	Design Eff	Min Eff	Design IPLV	Min IPLV	Category	Compliance

None

Project: 2024-075 Trinity UMC
Title: Trinity United Methodist Church Addition
Type: Religious Building
(WEA File: FL_PANAMA_CITY_BAY_CO.tm3)

Water Heater Compliance

Description	Type	Category	Design Eff	Min Eff	Design Loss	Max Loss	Compliance
IWH-1	Gas Instantaneous water heater	Unknown	0.97				**Not Checked**

Not Checked

Project: 2024-075 Trinity UMC
Title: Trinity United Methodist Church Addition
Type: Religious Building
(WEA File: FL_PANAMA_CITY_BAY_CO.tm3)

Piping System Compliance

Category	Pipe Dia [inches]	Is Runout?	Operating Temp [F]	Ins Cond [Btu-in/hr.SF.F]	Ins Thick [in]	Req Ins Thick [in]	Compliance
Heating System (Steam, Steam Condensate, & Hot Water)	1.00	False	139.00	0.28	1.50	0.50	**PASSES**

PASSES

Mandatory Requirements (as applicable)

Requirements compiled by US Department of Energy and Pacific Northwest National Laboratory. Adopted for FBC with permission. Not all may be applicable

Topic	Section	Component	Description	Yes	N/A	Exempt
1. To be checked by Designer or Engineer						
6037 Post Construction	C401.3	Envelope	A thermal envelope certificate will be supplied and completed by an approved third party.	☑	☐	☐
6031 Fenestration	C402.4.1	Envelope	The vertical fenestration area <= 30 percent of the gross above-grade wall area.	☑	☐	☐
6033 Fenestration	C402.4.1	Envelope	The skylight area <= 3 percent of the gross roof area.	☑	☐	☐
6036 Fenestration	C402.4.1.1	Envelope	Vertical Fenestration Area Allowance: A maximum of 40 percent of gross above-grade wall area is permitted to be vertical fenestration area provided in buildings not greater than two stories above grade, >= 50 percent of the conditioned floor area is within a daylight zone, in buildings three or more stories above grade, not less than 25 percent of the net floor area is within a daylight zone, daylight responsive controls are installed, and glazing assemblies within the scope of NFRC 200 have visible transmittance >= 1.1 times SHGC.	☑	☐	☐
6038 Fenestration	C402.4.1.2	Envelope	A maximum of 6 percent of roof area is permitted to be skylight area provided daylight responsive controls are installed in daylight zones under skylights.	☑	☐	☐

6039 Fenestration	C402.4.2	Envelope	In enclosed spaces > 2,500 ft2 directly under a roof with ceiling heights > 15 ft. and used as an office, lobby, atrium, concourse, corridor, storage, gymnasium/exercise center, convention center, automotive service, manufacturing, non-refrigerated warehouse, retail store, distribution/sorting area, transportation, or workshop, the following requirements apply: (a) the daylight zone under skylights is <= half the floor area; (b) the skylight area to daylight zone is >= 3 percent with a skylight VT >= 0.40; or a minimum skylight effective aperture >= 1 percent. []- Exception 1:C402.4.2: Buildings in climate zones 6 through 8. []- Exception 2:C402.4.2: Spaces where the proposed general lighting power densities < 0.5 W/ft2. []- Exception 3:C402.4.2: Areas with obstructions that block direct beam sunlight on >= 1/2 of the roof over the enclosed area for more than 1,500 daytime hours per year between 8 am and 4 pm. []- Exception 4:C402.4.2: Spaces where the daylight zone under rooftop monitors is > 50 percent of the enclosed space floor area. []- Exception 5:C402.4.2: Spaces where the total area net of daylight zones adjacent to vertical fenestration < 2,500 s.f. and where the lighting is controlled. []- Exception 6:C402.4.2: Requirement does not apply.	☑	☐	☐
6032 Fenestration	C402.4.3	Envelope	Vertical fenestration Maximum U-factor and SHGC value.	☑	☐	☐
6034 Fenestration	C402.4.3	Envelope	Skylight SHGC value.	☐	☑	☐
6040 Fenestration	C402.4.5	Envelope	U-factor of opaque swinging and nonswinging doors associated with the building thermal envelope meets requirements.	☑	☐	☐
6046 Post Construction	C402.5.11	Envelope	Operable openings > 40 ft2 will be interlocked with heating and cooling systems to setback setpoint temperatures within 10 minutes of opening. []- Exception 1:C402.5.11: Separately zoned areas. []- Exception 2:C402.5.11: Warehouses with overhead doors for occupancy. []- Exception 3:C402.5.11: Entrance doors located in exterior wall as part of a vestibule.	☑	☐	☐
6056 HVAC	C403.2.1	Mechanical	HVAC systems and equipment design loads calculated in accordance with ANSI/ASHRAE/ACCA Standard 183 or by an approved equivalent computational procedure []- Exception 1:C403.2.1: Mechanical systems are designed by a registered engineer	☑	☐	☐

6096 HVAC	C403.2.12.1	Mechanical	HVAC fan systems at design conditions do not exceed allowable fan system motor nameplate hp or fan system bhp. []- Exception 1:C403.2.12.1: Hospital and laboratory systems that utilize flow control devices on exhaust and/or return. []- Exception 2:C403.2.12.1: Individual exhaust fans with motor nameplate horsepower less than or equal 1 hp. []- Exception 3:C403.2.12.1: Requirement does not apply.	☑	☐	☐
6055 HVAC	C403.2.12.2	Mechanical	HVAC fan motors not oversized beyond allowable limits. []- Exception 1:C403.2.12.2: Fans equipped with electronic speed control devices []- Exception 2:C403.2.12.2: Fans with fan nameplate electrical input power < 0.89 kW []- Exception 3:C403.2.12.2: Fan system complying with Section C403.2.12.1 motor nameplate hp (Option 1). []- Exception 4:C403.2.12.2: Fans with motor nameplate horsepower < 1 hp (746 W). []- Exception 5:C403.2.12.2: Requirement does not apply.	☑	☐	☐
6141 SYSTEM_SPECIF	C403.2.12.3	Mechanical	Fans have a fan energy index (FEI) >= 1.00. Variable volume fans will have an FEI >= 0.95 at the design point of operation. []- Exception 1:C403.2.12.3: Single not embedded fans with motor nameplate horsepower of less than 1 hp (0.89 kW). []- Exception 2:C403.2.12.3: Embedded fans with motor nameplate horsepower exceeding 5 hp (4.1 kW). []- Exception 3:C403.2.12.3: Multiple fans in series or parallel have a combined motor nameplate horsepower of less or equal 5 hp and are operated functionally as a single fan. []- Exception 4:C403.2.12.3: Fans integral to equipment listed under Section C403.2.3. []- Exception 5:C403.2.12.3: Fans included in equipment having certified seal for air or energy performance of the equipment package. []- Exception 6:C403.2.12.3: Ceiling fans. []- Exception 7:C403.2.12.3: Fans for gases at temperatures above 425F. []- Exception 8:C403.2.12.3: Fans for operation in explosive atmospheres. []- Exception 9:C403.2.12.3: Reversible fans for tunnel ventilation. []- Exception 10:C403.2.12.3: Fans not covered by AMCA 208. []- Exception 11:C403.2.12.3: Fans intended to operate only during emergency conditions.	☑	☐	☐

6057 HVAC	C403.2.2	Mechanical	HVAC systems and equipment capacity does not exceed calculated loads. []- Exception 1:C403.2.2: Required standby equipment with proper controls per code. []- Exception 2:C403.2.2: Multiple units of the same type of equipment with sequencing controls. []- Exception 3:C403.2.2: Living spaces in commercial buildings shall be sized in accordance with Section R403.7.1.1 and its exceptions	☑	☐	☐
6087 HVAC	C403.2.7	Mechanical	Exhaust air energy recovery on systems meeting Table C403.7.4(1) and C403.7.4(2). []- Exception 1:C403.2.7: Where energy recovery systems are prohibited by the Florida Building Code, Mechanical []- Exception 2:C403.2.7: Laboratory fume hood systems []- Exception 3:C403.2.7: Systems serving spaces that are heated to less than 60°F (15.5°C) and are not cooled []- Exception 4:C403.2.7: Where more than 60 percent of the outdoor heating energy is provided from site-recovered or site solar energy []- Exception 5:C403.2.7: Heating energy recovery in Climate Zones 1 and 2 []- Exception 6:C403.2.7: Cooling energy recovery in Climate Zones 3C, 4C, 5B, 5C, 6B, 7 and 8 []- Exception 7:C403.2.7: Systems requiring dehumidification that employ energy recovery in series with the cooling coil []- Exception 8:C403.2.7: Where the largest source of air exhausted at a single location at the building exterior is less than 75 percent of the design outdoor air flow rate. []- Exception 9:C403.2.7: Systems expected to operate less than 20 hours per week at the outdoor air percentage covered by Table C403.2.7(1). []- Exception 10:C403.2.7: Systems exhausting toxic, flammable, paint or corrosive fumes or dust. []- Exception 11:C403.2.7: Commercial kitchen hoods used for collecting and removing grease vapors and smoke	☐	☑	☐
6047 HVAC	C403.3.2	Mechanical	Economizer operation will not increase heating energy use during normal operation. []- Exception 1:C403.3.2: Economizers on VAV systems.	☐	☑	☐

6093 HVAC	C403.3.3, C403.3.3.1, C403.3.3.2, C403.3.3.3, C403.3.3.4, C403.3.3.5	Mechanical	Air economizers provided where required, meet the requirements for design capacity, control signal, ventilation controls, high-limit shut-off, integrated economizer control, and provide a means to relieve excess outside air during operation. []- Exception 1:C403.3_C403.3.2: Buildings located in Climate Zones 1A and 1B. []- Exception 2:C403.3_C403.3.2: Individual DX fan cooling units have a capacity is < 54 KBtu/h (15.8 kW) or total chilled water system capacity < minimum specified in Table C403.3(1). []- Exception 3:C403.3_C403.3.2: Where more than 25 % of the air supplied to spaces that are designed to be humidified above 35°F (1.7°C) dewpoint temperature to satisfy process needs []- Exception 4:C403.3_C403.3.2: Systems that serve residential spaces where the system capacity is < 270 kBtu/h []- Exception 5:C403.3_C403.3.2: Systems expected to operate less than 20 hours per week []- Exception 6:C403.3_C403.3.2: System serves supermarket areas with open refrigerated casework. []- Exception 7:C403.3_C403.3.2: Where the minimum code required cooling efficiency of the HVAC unit rated with an IPLV, IEER or SEER is increased by at least 17 %. []- Exception 8:C403.3_C403.3.2: Chilled-water cooling systems that are passive (without a fan) capacity is < the minimum specified in Table C403.3(1). []- Exception 9:C403.3_C403.3.2: Systems that include a heat recovery system in accordance with Section C403.4.5 []- Exception 10:C403.3_C403.3.2: Economizers on VAV systems cause zone-level heating to increase due to a reduction in supply air temperature.	☐	☑	☐
6042 HVAC	C403.3.4, C403.3.4.1, C403.3.4.2, C403.3.1	Mechanical	Water economizers provided where required, meet the requirements for design capacity, maximum pressure drop and integrated economizer control. []- Exception 1:C403.2.12.5_C403.2.12.5.1_C403.2.12.5.2: Modulating fan control not required for chilled water and evaporative cooling units with fan motors of < 1 hp where the units are not used to provide ventilation air and the indoor fan cycles with the load. []- Exception 2:C403.2.12.5_C403.2.12.5.1_C403.2.12.5.2: Requirement does not apply.	☐	☑	☐
6053 HVAC	C403.4.2.3.1	Mechanical	Hydronic heat pump systems connected to a common water loop meet heat rejection and heat addition requirements. []- Exception 1:C403.4.2.3.1: A deadband of less than 20°F is allowed where a temperature optimization controller is used.	☐	☑	☐

6144 Mandatory Additior	C406.6	Project	Dedicate outdoor air system efficiency energy credit - Building equipped with independent ventilation system designed to provide 100-percent outdoor air to each individual occupied space, as specified by the IMC. The ventilation system is capable of total energy recovery and includes HVAC system controls that manage temperature resets at least 25 percent of delta design supply-air / room-air temp.	☐	☑	☐
2. To be checked by Plan Reviewer						
6004 Plan Review	C103.2	Mechanical	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the mechanical and service water heating systems and document where exceptions to the standard are claimed. Load calculations per acceptable engineering standards and handbooks. Hot water system sized per manufacturer's sizing guide.	☐	☐	☐
6011 Plan Review	C103.2	Interior Lighting	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the interior lighting and electrical systems and equipment and document where exceptions to the standard are claimed. The information provided should include lighting controls per sections C405.2 and C405.3.	☐	☐	☐
6023 Plan Review	C103.2	Exterior Lighting	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the exterior lighting and electrical systems and equipment and document where exceptions to the standard are claimed. The information provided should include Exterior lighting power requirements (Mandatory) per section C405.4.	☐	☐	☐
6001 Plan Review	C103.2, C103.2.1	Envelope	Plans and/or specifications provide all information with which compliance can be determined for the building envelope and document where exceptions to the standard are claimed.	☐	☐	☐
6081 HVAC	C402.2.6	Mechanical	Thermally ineffective panel surfaces of sensible heating panels have insulation >= R-3.5. []- Exception 1:C402.2.6: Heated slabs on grade insulated in accordance with Section C402.2.5 []- Exception 2:C402.2.6: Requirement does not apply.	☐	☐	☐
6100 HVAC	C403.2.13	Mechanical	Systems that heat outside the building envelope are radiant heat systems controlled by an occupancy sensing device or timer switch. []- Exception 1:C403.12.1: Requirement does not apply.	☐	☐	☐
6068 HVAC	C403.2.4.1.3	Mechanical	Reset static pressure setpoint for DDC controlled VAV boxes reporting to central controller based on the zones requiring the most pressure. []- Exception 1:C403.4.1.3: Requirement does not apply.	☐	☐	☐

6107 HVAC	C403.2.4.2	Mechanical	Each zone equipped with setback controls using automatic time clock or programmable control system. []- Exception 1:C403.2.4.2: Zones operated continuously. []- Exception 2:C403.2.4.2: Zones have a full HVAC load demand not exceeding 6,800 Btu/h (2 kW) and having a readily accessible manual shutoff switch. []- Exception 3:C403.2.4.2: Requirement does not apply.	☐ ☐ ☐
6123 HVAC	C403.2.4.4	Mechanical	Zone isolation devices and controls installed where applicable. []- Exception 1:C403.2.4.4: Exhaust and outdoor air connections having fan systems 5000 cfm or smaller. []- Exception 2:C403.2.4.4: Exhaust airflow less than 10% of design. []- Exception 3:C403.2.4.4: Zones and systems intended to operate continuously or are inoperative when all other zones are inoperative. []- Exception 4:C403.2.4.4: Requirement does not apply.	☐ ☐ ☐
6124 HVAC	C403.2.4.7	Mechanical	Fault detection and diagnostics installed with air-cooled unitary DX units or VRF units having economizers. []- Exception 1:C403.2.4.7: Requirement does not apply.	☐ ☐ ☐
6125 HVAC	C403.2.5	Mechanical	Hot water boilers supplying heat via one- or two-pipe systems include outdoor setback control. []- Exception 1:C403.2.5: Requirement does not apply.	☐ ☐ ☐
6089 HVAC	C403.2.6	Mechanical	Natural or mechanical ventilation is provided in accordance with International Mechanical Code Chapter 4. Mechanical ventilation has capability to reduce outdoor air supply to minimum per IMC Chapter 4. []- Exception 1:C403.2.2: Requirement does not apply.	☐ ☐ ☐
6090 HVAC	C403.2.6.1	Mechanical	Demand control ventilation provided for spaces >500 ft2 and >=25 people/1000 ft2 occupant density and served by systems with air side economizer, auto modulating outside air damper control, or design airflow >3,000 cfm. []- Exception 1:C403.2.6.1: Systems with energy recovery complying with Section C403.2.7. []- Exception 2:C403.2.6.1: Multiple-zone systems without DDC. []- Exception 3:C403.2.6.1: Multiple-zone systems with design outdoor air of less than 1200 cfm. []- Exception 4:C403.2.6.1: Spaces where the supply airflow rate minus any makeup or outgoing transfer air requirement is < 1,200 cfm []- Exception 5:C403.2.6.1: Ventilation provided for process loads only []- Exception 6:C403.2.6.1: Requirement does not apply.	☐ ☐ ☐

6098 HVAC	C403.4.2	Mechanical	The heating of fluids in hydronic systems that have been previously mechanically cooled, and the cooling of fluids that have been previously mechanically heated are limited in accordance with Sections C403.4.2.1-C403.4.2.3. Single boiler systems >500 kBtu/h have multistaged or modulating burner. []- Exception 1:C403.4.2: Requirement does not apply.	☐ ☐ ☐
6142 HVAC	C403.4.2.3.2	Mechanical	Closed-circuit cooling tower within heat pump loop have either automatic bypass valve or lower leakage positive closure dampers. Open-circuit tower within heat pump loop have automatic valve to bypass all heat pump water flow around the tower. Open- or closed-circuit cooling towers used in conjunction with a separate heat exchanger have heat loss by shutting down the circulation pump on the cooling tower loop. Open- or closed circuit cooling towers have a separate heat exchanger to isolate the cooling tower from the heat pump loop, and heat loss is controlled by shutting down the circulation pump on the cooling tower loop. []- Exception 1:C403.4.2.3.2: Heat pump system must reject heat throughout the year. []- Exception 2:C403.4.2.3.2: Requirement does not apply.	☐ ☐ ☐
6116 HVAC	C403.4.2.5	Mechanical	System turndown requirement met through multiple single-input boilers, one or more modulating boilers, or a combination of single-input and modulating boilers. Boiler shall comply with the turndown ratio specified in Table C403.4.2.5.	☐ ☐ ☐
6071 HVAC	C403.4.2.6	Mechanical	Chilled water plants with multiple chillers have capability to reduce flow automatically through the chiller plant when a chiller is shut down. Boiler plants with multiple boilers have the capability to reduce flow automatically through the boiler plant when a boiler is shut down.	☐ ☐ ☐
6099 HVAC	C403.4.3.1	Mechanical	Fan systems with total system motor capacity >=5 hp associated with heat rejection equipment configured to automatically modulate the fan speed to control the leaving fluid temperature or condensing temp/pressure of heat rejection device. []- Exception 1:C403.4.3.1: Fans serve multiple refrigerant or fluid cooling circuits. []- Exception 2:C403.4.3.1: Condenser fans serve flooded condensers. []- Exception 3:C403.4.3.1: Requirement does not apply.	☐ ☐ ☐
6120 HVAC	C403.4.3.4	Mechanical	Open-circuit cooling towers having water cooled chiller systems and multiple or variable speed condenser pumps, are designed so that tower cells can run in parallel with larger of flow criteria. []- Exception 1:C403.4.3.4: Requirement does not apply.	☐ ☐ ☐

6103 HVAC	C403.6.1	Mechanical	Hydronic and multizone HVAC system controls are VAV fans driven by mechanical or electrical variable speed drive per Table C403.4.1.1. []- Exception 1:C403.4.4: Zones or supply air systems where >= 75 % of the energy for reheating or for providing warm air in mixing systems is provided from a site-recovered or site-solar energy source []- Exception 2:C403.4.4: Zones where special humidity levels are required to satisfy process needs []- Exception 3:C403.4.4: Zones with a peak supply air of <= 300 cfm (142 L/s) and where the flow rate is < 10 % of the total fan system supply airflow rate. []- Exception 4:C403.4.4: Zones where the volume of air to be reheated, recooled or mixed is <= the minimum ventilation requirements of Chapter 4 of the Florida Building Code, Mechanical []- Exception 5:C403.4.4: Zones or supply air systems with thermostatic and humidistatic controls capable of preventing reheating, recooling, mixing or simultaneous supply of air that has been previously cooled []- Exception 6:C403.4.4: Requirement does not apply.	☐ ☐ ☐
6122 HVAC	C404.2.1	Mechanical	Gas-fired water-heating equipment installed in new buildings: where a singular piece of water-heating equipment >= 1,000 kBtu/h serves the entire building, thermal efficiency <= 92 Et. Where multiple pieces of water-heating equipment serve the building with combined rating <= 1,000 kBtu/h, the combined input-capacity-weighted-average thermal efficiency <= 90 Et. Exclude input rating of equipment in individual dwelling units and equipment <= 100 kBtu/h []- Exception 1:C404.2.1: 25 percent or more of the annual service water heating requirement is provided by on-site renewable energy or site-recovered energy. []- Exception 2:C404.2.1: Water heaters installed in individual dwelling units shall not be required to be included in the total input rating of service waterheating equipment []- Exception 3:C404.2.1: Water heaters with an input rating of <= 100,000 Btu/h (29.3 kW) not required to be included in the total input rating of service water-heating equipment []- Exception 4:C404.2.1: Requirement does not apply.	☐ ☐ ☐
6114 HVAC	C404.4	Mechanical	All piping insulated in accordance with section details and Table C403.12.3. []- Exception 1:C404.4: Requirement does not apply.	☐ ☐ ☐
6019 HVAC	C404.5, C404.5.1, C404.5.2	Mechanical	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details. []- Exception 1:C404.5_C404.5.1_C404.5.2: Requirement does not apply.	☐ ☐ ☐

6022 HVAC	C404.6.3	Mechanical	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle. []- Exception 1:C404.6.3: Requirement does not apply.	☐ ☐ ☐
6026 HVAC	C404.7	Mechanical	Demand recirculation water systems have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F. []- Exception 1:C404.7: Requirement does not apply.	☐ ☐ ☐
6048 Plan Review	C405.5.2	Project	Group R-2 dwelling units have separate electrical meters. []- Exception 1:C405.5.2: Requirement does not apply.	☐ ☐ ☐
6030 Plan Review	C406	Project	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the additional energy efficiency package options.	☐ ☐ ☐
6084 HVAC	C408.2.2.2	Mechanical	HVAC hydronic heating and cooling coils have means to balance and have pressure test connections. []- Exception 1:C408.2.2.2: Pumps with pump motors of 5 hp (3.7 kW) or less. []- Exception 2:C408.2.2.2: Where throttling results in no greater than 5 percent of the nameplate horsepower draw above that required if the impeller were trimmed.	☐ ☐ ☐

3. To be checked by Inspector

6016 Insulation	C104	Envelope	Installed above-grade wall insulation type and R-value consistent with insulation specifications reported in plans.	☐ ☐ ☐
6006 Insulation	C104, C303.1.1	Envelope	Installed roof insulation type and R-value consistent with insulation specifications reported in plans. For some ceiling systems, verification may need to occur during Framing Inspection.	☐ ☐ ☐
6008 Insulation	C104.2.1	Envelope	Installed slab-on-grade insulation type and R-value consistent with insulation specifications reported in plans.	☐ ☐ ☐
6007 Insulation	C303.1, C303.1.1	Envelope	Roof insulation installed per manufacturer's instructions and is labeled with R-value or insulation certificate providing R-value and other relevant data. Blown or poured loose-fill insulation is installed only where the roof slope is > 3 in 12.	☐ ☐ ☐
6035 Fenestration	C303.1.3	Envelope	Fenestration products rated in accordance with NFRC certified and as to performance labels or certificates provided. []- Exception 1:C303.1.3: Default values are used.	☐ ☐ ☐
6020 Insulation	C303.2	Envelope	Above-grade wall insulation installed per manufacturer's instructions.	☐ ☐ ☐
6005 Insulation	C303.2, C303.2.1	Envelope	Below-grade wall insulation installed per manufacturer's instructions.	☐ ☐ ☐

6013 Insulation	C303.2, C303.2.1	Envelope	Slab edge insulation installed per manufacturer's instructions and the Florida Building Code, Building.	☐ ☐ ☐
6027 Insulation	C303.2, C402.2.4	Envelope	Floor insulation installed per manufacturer's instructions. Cavity or structural slab insulation installed in permanent contact with underside of decking or structural slabs. []- Exception 1:C303.2_C402.2.4: All perimeter framing fully insulated at metal or wood framed prescriptive levels. []- Exception 2:C303.2_C402.2.4: Concrete floor slab insulation turns up and contacts underside of floor under wall assembly. []- Exception 3:C303.2_C402.2.4: Requirement does not apply.	☐ ☐ ☐
6015 Insulation	C303.2.1	Envelope	Exterior insulation protected against damage, sunlight, moisture, wind, landscaping and equipment maintenance activities.	☐ ☐ ☐
6002 Insulation	C402.1.3	Envelope	Installed below-grade wall insulation type and R-value consistent with insulation specifications reported in plans.	☐ ☐ ☐
6061 Insulation	C402.1.3	Envelope	Non-swinging opaque doors have R-4.75 insulation. []- Exception 1:C402.1.3: Requirement does not apply.	☐ ☐ ☐
6012 Insulation	C402.2.2	Envelope	Skylight curbs are insulated to the level of roofs with insulation above deck or R-5, whichever is less. []- Exception 1:C402.2.1.5: Unit skylight curbs included as a component of a skylight listed and labeled per NFRC 100. []- Exception 2:C402.2.1.5: Requirement does not apply.	☐ ☐ ☐
6064 Insulation	C402.2.2	Envelope	Roof assembly meets minimal thermal resistance installed between roof framing or in a continuous fashion on the roof assembly as stipulated in Table C402.1.3. Requirements for above deck insulation, minimum thickness, suspended ceilings, staggered joints and skylight curbs will be met. []- Exception 1:C402.2.1: Requirement does not apply.	☐ ☐ ☐
6024 Insulation	C402.2.3	Envelope	Installed floor insulation type and R-value consistent with insulation specifications reported in plans.	☐ ☐ ☐
6021 Insulation	C402.2.5, C402.2.5.1	Envelope	Slab edge insulation depth/length. Slab insulation extending away from building is covered by pavement or >= 10 inches of soil. []- Exception 1:C402.2.5_C402.2.5.1: Requirement does not apply.	☐ ☐ ☐
6051 Insulation	C402.2.6	Envelope	Radiant panels and associated components, designed for heat transfer from the panel surfaces to the occupants or indoor space are insulated with a minimum of R-3.5. []- Exception 1:C402.2.6: Heated slab-on-grade. []- Exception 2:C402.2.6: Requirement does not apply.	☐ ☐ ☐

6014 Insulation	C402.3	Envelope	High-albedo roofs satisfy one of the following: 3-year-aged solar reflectance >= 0.55 (0.63 for Climate Zone 1A) and thermal emittance >= 0.75 or 3-year-aged solar reflectance index >= 64.0 (75 for Climate Zone 1A). []- Exception 1:C402.3: Roof Over Conditioned Space With No Cooling. []- Exception 2:C402.3: Ballasted Roof. []- Exception 3:C402.3: Vegetated Roof (75% coverage). []- Exception 4:C402.3: Shaded or Covered Roof (75% coverage). []- Exception 5:C402.3: Asphaltic Membrane Roof. []- Exception 6:C402.3: Steep Sloped Roof.	☐ ☐ ☐
6028 Fenestration	C402.4.3	Envelope	Installed skylight U-factor and SHGC consistent with label specifications and as reported in plans.	☐ ☐ ☐
6025 Fenestration	C402.4.3, C402.4.3.4	Envelope	Installed vertical fenestration U-factor and SHGC consistent with label specifications and as reported in plans.	☐ ☐ ☐
6043 Air Leakage	C402.5	Envelope	Building envelope contains a continuous air barrier that has been tested and deemed to limit air leakage <= 0.40 cfm/ft2 of the building thermal envelope area at a pressure differential of 0.3 inch water gauge (75 Pa).	☐ ☐ ☐
6044 Air Leakage	C402.5.1	Envelope	The building envelope contains a continuous air barrier that is sealed in an approved manner and either constructed or tested in an approved manner. Air barrier penetrations are sealed in an approved manner. []- Exception 1:C402.5.1: Requirement does not apply.	☐ ☐ ☐
6003 Air Leakage	C402.5.1.1	Envelope	All sources of air leakage in the building thermal envelope are sealed, caulked, gasketed, weather stripped or wrapped with moisture vapor-permeable wrapping material to minimize air leakage.	☐ ☐ ☐
6062 Air Leakage	C402.5.1.2.1	Envelope	The building envelope contains a continuous air barrier that is sealed in an approved manner and material permeability <= 0.004 dfm/ft2. Air barrier penetrations are sealed in an approved manner. []- Exception 1:C402.5.1.2.1: Requirement does not apply.	☐ ☐ ☐
6065 Air Leakage	C402.5.1.2.2	Envelope	The building envelope contains a continuous air barrier that is sealed in an approved manner and average assembly air leakage <= 0.04 cfm/ft2. Air barrier penetrations are sealed in an approved manner. []- Exception 1:C402.5.1.2.2: Requirement does not apply.	☐ ☐ ☐

6052 Air Leakage	C402.5.4	Envelope	Factory-built fenestration and doors are labeled as meeting air leakage requirements. []- Exception 1:C402.5.4: Field fabricated fenestration assemblies. []- Exception 2:C402.5.4: Fenestration in buildings that comply with air leakage requirements with a whole building air leakage test. []- Exception 3:C402.5.4: Doors that comply with special International Building Code requirements.	☐ ☐ ☐
6009 Air Leakage	C402.5.5, C402.5.11, 403.6	Envelope	Stair and elevator shaft vents have motorized dampers that automatically close. Reference section C403.6 for operational details.	☐ ☐ ☐
6049 Air Leakage	C402.5.6	Envelope	Weatherseals installed on all loading dock cargo door openings and provide direct contact along the top and sides of vehicles parked in the doorway. []- Exception 1:C402.5.6: Requirement does not apply.	☐ ☐ ☐
6050 Air Leakage	C402.5.7	Envelope	Vestibules are installed on all building entrances. Doors have self-closing devices. []- Exception 1:C402.5.7: Building entrances with revolving doors. []- Exception 2:C402.5.7: Doors not intended to be used as a building entrance. []- Exception 3:C402.5.7: Doors opening directly from a sleeping unit or dwelling unit. []- Exception 4:C402.5.7: Doors that open directly from a space <=3000 ft2. []- Exception 5:C402.5.7: Doors with air curtain. []- Exception 6:C402.5.7: Existing door is being replaced and existing vestibules not removed. []- Exception 7:C402.5.7: Requirement does not apply.	☐ ☐ ☐
6045 Air Leakage	C402.5.8	Envelope	Recessed luminaires in thermal envelope to limit infiltration and be IC rated and labeled. Seal between interior finish and luminaire housing. []- Exception 1:C402.5.10: Requirement does not apply.	☐ ☐ ☐
6086 HVAC	C403.2	Mechanical	HVAC equipment efficiency verified.	☐ ☐ ☐

6092 HVAC	C403.2.10	Mechanical	HVAC piping insulation insulated in accordance with Table C403.2.10. Insulation exposed to weather is protected from damage and is provided with shielding from solar radiation. []- Exception 1:C403.2.10: Factory-installed piping within HVAC equipment []- Exception 2:C403.2.10: Factory-installed piping within room fan-coils and unit ventilators tested under AHRI 440. []- Exception 3:C403.2.10: Piping that conveys fluids that have a design operating temperature range between 60 and 105°F. []- Exception 4:C403.2.10: Fluid not heated or cooled. []- Exception 5:C403.2.10: Strainers and valves associated with 1 inch or smaller piping. []- Exception 6:C403.2.10: Underground piping with fluids no hotter than 60ºF. []- Exception 7:C403.2.10: Piping design for radiant heating systems []- Exception 8:C403.2.10: Requirement does not apply.	☐ ☐ ☐
6171 HVAC	C403.2.12.4	Mechanical	Motors for fans that are not less than 1/12 hp and less than 1 hp are electronically commutated motors or have a minimum motor efficiency of 70 percent. These motors have the means to adjust motor speed for either balancing or remote control. []- Exception 1:C403.2.12.4: Motors in the airstream within fan coils and terminal units only provide heating to the space served. []- Exception 2:C403.2.12.4: Motors in space-conditioning equipment that comply with Section C403.2.3 or C403.2.12. []- Exception 3:C403.2.12.4: Motors that comply with Section C405.7. []- Exception 4:C403.2.12.4: Requirement does not apply.	☐ ☐ ☐
6173 HVAC	C403.2.12.5.1	Mechanical	Each DX cooling system >= 65 kBtu and chiller water/evaporative cooling system with fans >= 1/4 hp are designed to vary the indoor fan airflow as a function of load and comply with detailed requirements of this section. []- Exception 1:C403.2.12.5.1: Modulating fan control is not required for chilled water and evaporative cooling units with fan motors of less than 1 hp where the units are not used to provide ventilation air and the indoor fan cycles with the load. []- Exception 2:C403.2.12.5.1: Where the volume of outdoor air required to comply with the ventilation requirements of the IMC at low speed exceeds the air that would be delivered per Section C403.2.12.5 []- Exception 3:C403.2.12.5.1: Requirement does not apply.	☐ ☐ ☐

6097 HVAC	C403.2.12.5.2	Mechanical	VAV fans have static pressure sensors located so controller setpoint <=1.2 w.c.. []- Exception 1:C403.2.12.5.2: Requirement does not apply.	☐ ☐ ☐
6168 HVAC	C403.2.12.5.2	Mechanical	Static pressure sensors used to control VAV fans located such that the controller setpoint is <= 1.2 inches w.c.. Where this results in one or more sensors being located downstream of major duct splits, not less than one sensor located on each major branch. []- Exception 1:C403.2.12.5.2: Requirement does not apply.	☐ ☐ ☐
6167 HVAC	C403.2.12.5.3	Mechanical	Systems with DDC of individual zones reporting to the central control panel configured to reset the static pressure setpoint based on zone requiring the most pressure. The DDC is capable of monitoring zone damper positions or have an alternative method of indicating the need for static pressure. See section for details. []- Exception 1:C403.2.12.5.3: Requirement does not apply.	☐ ☐ ☐
6178 HVAC	C403.2.12.6	Mechanical	Large diameter fans where installed shall be tested and labeled in accordance with AMCA 230. []- Exception 1:C403.2.12.6: Requirement does not apply.	☐ ☐ ☐
6155 HVAC	C403.2.14, C403.2.14.1, C403.2.14.2	Mechanical	Refrigeration equipment performance shall be determined in accordance with sections C403.2.14.1 and C403.2.14.2 for commercial refrigerators, freezers, refrigerator-freezers, walk-in coolers, walk-in freezers and refrigeration equipment. []- Exception 1:C403.5: Systems have working fluid in the refrigeration cycle that goes through both subcritical and supercritical states (transcritical). []- Exception 2:C403.5: Systems use ammonia refrigerant. []- Exception 3:C403.5: Requirement does not apply.	☐ ☐ ☐
6102 HVAC	C403.2.3	Mechanical	PTAC and PTHP with sleeves 16 in. by 42 in. labeled for replacement only as per Footnote b to Tables C403.2.3(1) and C403.2.3(2). []- Exception 1:C403.3: Requirement does not apply.	☐ ☐ ☐
6058 HVAC	C403.2.4.1	Mechanical	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system. []- Exception 1:C403.2.4.1: TRUE	☐ ☐ ☐
6059 HVAC	C403.2.4.1.1	Mechanical	Heat pump controls prevent supplemental electric resistance heat from coming on when not needed. []- Exception 1:C403.2.4.1.1: Requirement does not apply.	☐ ☐ ☐
6060 HVAC	C403.2.4.1.2	Mechanical	Thermostatic controls have a 5 °F deadband. []- Exception 1:C403.2.4.1.2: Manual changeover thermostats. []- Exception 2:C403.2.4.1.2: Precision indoor temperature control required.	☐ ☐ ☐

6085 HVAC	C403.2.4.1.3	Mechanical	Temperature controls have setpoint overlap restrictions. []- Exception 1:C403.2.4.1.3: Requirement does not apply.	☐	☐	☐
6108 HVAC	C403.2.4.2.1, C403.2.4.2.2	Mechanical	Automatic Controls: Setback to 55°F (heat) and 85°F (cool); 7-day clock, 2-hour occupant override, 10-hour backup []- Exception 1:C403.2.4.2.1_C403.2.4.2.2: Requirement does not apply.	☐	☐	☐
6110 HVAC	C403.2.4.2.3	Mechanical	Systems include optimum start controls. []- Exception 1:C403.2.4.2.3: Requirement does not apply.	☐	☐	☐
6088 Air Leakage	C403.2.4.3	Mechanical	Outdoor air and exhaust systems have motorized dampers that automatically shut when not in use and meet maximum leakage rates. Check gravity dampers where allowed. Reference section language for operational details. []- Exception 1:C403.2.4.3: Gravity dampers acceptable in buildings less than 3 stories. []- Exception 2:C403.2.4.3: Gravity dampers acceptable for exhaust and relief dampers in climate zones 0, 1, 2, or 3. []- Exception 3:C403.2.4.3: Gravity dampers acceptable in systems with outside or exhaust air flow rates less than or equal to 300 cfm. []- Exception 4:C403.2.4.3: Dampers no larger than 24 inches in any dimension are to have a leakage rate of 40 cfm/ft2 at 1.0 inch water gauge when tested with AMCA 500D. []- Exception 5:C403.2.4.3: Requirement does not apply.	☐	☐	☐
6029 HVAC	C403.2.4.5	Mechanical	Snow/ice melting system and freeze protection systems have sensors and controls configured to limit service for pavement temperature above 50°F and outdoor temperature above 40°F. []- Exception 1:C403.12.2_C403.12.3: Requirement does not apply.	☐	☐	☐
6170 HVAC	C403.2.4.8	Mechanical	HVAC systems serving guestrooms in Group R-1 buildings with < 50 guestrooms: Each guestroom is provided with controls that automatically manage temperature setpoint and ventilation (see sections C403.2.4.8.1 and C403.2.4.8.2). []- Exception 1:C403.2.4.8: Requirement does not apply.	☐	☐	☐
6128 HVAC	C403.2.6.2	Mechanical	Enclosed parking garage ventilation has automatic contaminant detection and capacity to stage or modulate fans to 50% or less of design capacity. []- Exception 1:C403.2.6.2: Garages with no mechanical cooling or heating that have exhaust capacity < 8,000 cfm. []- Exception 2:C403.2.6.2: Garages with no mechanical cooling or heating that have a ratio of garage area ventilation to ventilation system motor nameplate hp exceed 1125 cfm/hp. []- Exception 3:C403.2.6.2: Requirement does not apply.	☐	☐	☐

6169 HVAC	C403.2.7	Mechanical	Units that provide ventilation air to multiple zones and operate in combination with zone heating and cooling systems do not use heating or heat recovery to warm supply air to a temperature greater than 60°F when representative building loads or outdoor air temperatures indicate that the majority of zones require cooling. []- Exception 1:C403.7.3: Requirement does not apply.	☐ ☐ ☐
6129 HVAC	C403.2.8	Mechanical	Kitchen exhaust systems comply with replacement air and conditioned supply air limitations, and satisfy hood rating requirements and maximum exhaust rate criteria. []- Exception 1:C403.2.8: Requirement does not apply.	☐ ☐ ☐
6091 HVAC	C403.2.9	Mechanical	HVAC ducts and plenums insulated in accordance with C403.2.9.1 and constructed in accordance with C403.2.9.2, Sealed in accordance with C403.2.9.3. verification may need to occur during Foundation Inspection. []- Exception 1:C403.2.9_C403.2.9.1: Factory-installed as part of HVAC equipment. []- Exception 2:C403.2.9_C403.2.9.1: Where the design temperature difference between the inside and outside of the duct or plenum is less than 15ºF. []- Exception 3:C403.2.9_C403.2.9.1: Runouts less than 10 feet (3048 mm) in length to air terminals or air outlets, the rated R-value of insulation need not exceed R-5. []- Exception 4:C403.2.9_C403.2.9.1: Backs of air outlets and outlet plenums exposed to unconditioned spaces need not exceed R-2. []- Exception 5:C403.2.9_C403.2.9.1: Return air ducts meeting all the requirements for building cavities that will be used as return air plenums []- Exception 6:C403.2.9_C403.2.9.1: Requirement does not apply.	☐ ☐ ☐
6174 SYSTEM_SPECIF	C403.3.2	Mechanical	Equipment minimum efficiency:	☐ ☐ ☐
6175 SYSTEM_SPECIF	C403.3.2	Mechanical	Equipment minimum efficiency:	☐ ☐ ☐
6157 HVAC	C403.3.3.3	Mechanical	Air economizers automatically reduce outdoor air intake to the design minimum outdoor air quantity when outdoor air intake will not reduce cooling energy usage. See Table C403.3.3.3 for applicable device types and climate zones. []- Exception 1:C403.3.3.3: Requirement does not apply.	☐ ☐ ☐
6158 HVAC	C403.3.3.4	Mechanical	System capable of relieving excess outdoor air during air economizer operation to prevent over pressurizing the building. The relief air outlet located to avoid recirculation into the building. []- Exception 1:C403.3.3.4: Requirement does not apply.	☐ ☐ ☐

6159 HVAC	C403.3.3.5	Mechanical	Return, exhaust/relief and outdoor air dampers used in economizers have motorized dampers that automatically shut when not in use and meet maximum leakage rates. Reference section C403.2.4.3 for details. []- Exception 1:C403.3.3.5: Requirement does not apply.	☐ ☐ ☐
6094 HVAC	C403.4.1.4	Mechanical	Heating for vestibules and air curtains with integral heating include automatic controls that shut off the heating system when outdoor air temperatures < 45F. Vestibule heating and cooling systems controlled by a thermostat in the vestibule with heating setpoint <= 60F and cooling setpoint <= 80F. []- Exception 1:C402.5.7: Buildings in Climate Zones 1 and 2. []- Exception 2:C402.5.7: Requirement does not apply.	☐ ☐ ☐
6082 HVAC	C403.4.2.1	Mechanical	Three-pipe hydronic systems using a common return for hot and chilled water are not used.	☐ ☐ ☐
6095 HVAC	C403.4.2.2	Mechanical	Two-pipe hydronic systems using a common distribution system have controls to allow a deadband >=15 °F, allow operation in one mode for at least 4 hrs before changeover, and have rest controls to limit heating and cooling supply temperature to <=30 °F.	☐ ☐ ☐
6072 HVAC	C403.4.2.3.3	Mechanical	Two-position automatic valve interlocked to shut off water flow when hydronic heat pump with pumping system > 10 hp is off.	☐ ☐ ☐
6172 HVAC	C403.4.3.2	Mechanical	Multiple-cell heat rejection equipment with variable speed fan drives are controlled to operate the maximum number of fans allowed and so that all fans operate at the same fan speed required for the instantaneous cooling duty. The minimum fan speed will be the minimum allowable speed of the fan drive system in accordance with the manufacturer's recommendations. []- Exception 1:C403.4.3.2: Requirement does not apply.	☐ ☐ ☐
6118 SYSTEM_SPECIFI	C403.4.3.3	Mechanical	Centrifugal fan open-circuit cooling towers having combined rated capacity >= 1100 gpm meets minimum efficiency requirement: >=40.2 gpm/hp. []- Exception 1:C403.4.3.3: Centrifugal open-circuit cooling towers with external sound attenuation or that have ducted inlet or discharge. []- Exception 2:C403.4.3.3: Requirement does not apply.	☐ ☐ ☐
6160 HVAC	C403.4.4	Mechanical	Supply air systems serving multiple zones have VAV systems with controls configured to reduce the volume of air that is reheated, recooled or mixed in each zone. See section for details. []- Exception 1:C403.6.1: Zones or systems with at least 75% of energy used for heating or warming air Systems that prevent reconditioning, mixing or simultaneous supply of air that has previously been mechanically cooled (including via economizers) or heated. []- Exception 2:C403.6.1: Requirement does not apply.	☐ ☐ ☐

6161 HVAC	C403.4.4.1	Mechanical	Single-duct VAV systems use terminal devices configured to reduce the supply of primary supply air before reheating or recooling takes place. []- Exception 1:C403.4.4.1: Requirement does not apply.	☐	☐	☐
6162 HVAC	C403.4.4.2	Mechanical	Systems that have 1 warm air duct and 1 cool air duct use terminal devices configured to reduce the flow from one duct to a minimum before mixing of air from the other duct takes place. []- Exception 1:C403.4.4.1: Requirement does not apply.	☐	☐	☐
6163 HVAC	C403.4.4.3	Mechanical	Individual dual-duct or mixing heating and cooling systems with a single fan and with total capacities > 90,000 Btu/h not equipped with air economizers. []- Exception 1:C403.4.4.1: Requirement does not apply.	☐	☐	☐
6164 HVAC	C403.4.4.5	Mechanical	Multiple zone HVAC systems have supply air temperature reset controls based on building loads or outside temperatures. []- Exception 1:C403.4.4.5: Systems that prevent re-heating, re-cooling, or mixing of heated and cooled supply air. []- Exception 2:C403.4.4.5: Systems in which at least 75% of the energy for reheating is from site recovered or site solar energy resources. []- Exception 3:C403.4.4.5: Zones in climate zones 1A and 3A with less than 300 cfm design outside air. []- Exception 4:C403.4.4.5: Zones in climate zone 2A with with less than 10,000 cfm of design outside air. []- Exception 5:C403.4.4.5: Zones in climate zones 1A, 2A, and 3A with >= 80% outside air and employing exhaust air energy recovery. []- Exception 6:C403.4.4.5: Requirement does not apply.	☐	☐	☐
6165 HVAC	C403.4.4.6	Mechanical	Multiple zone VAV systems with DDC of individual zone boxes have static pressure setpoint reset controls. []- Exception 1:C403.4.4.6: VAV systems that recirculate air from other zones without directly mixing it with outdoor air or dual-duct dual-fan VAV systems, or VAV systems with fan-powered terminal units. []- Exception 2:C403.4.4.6: Systems where the design exhaust airflow is more than 70% of design outdoor air intake flow. []- Exception 3:C403.4.4.6: Requirement does not apply.	☐	☐	☐

6166 HVAC	C403.4.4.7	Mechanical	Parallel-flow fan-powered VAV air terminals have automatic controls configured to 1) turn off the terminal fan except when space heating is required or where required for ventilation, 2) turn on the terminal fan as the first stage of heating before the heating coil is activated, and 3) during heating for warmup or setback temperature control, either operate the terminal fan and heating coil without primary air or, reverse the terminal damper logic and provide heating from the central air handler by primary air. []- Exception 1:C403.4.4.7: Requirement does not apply.	☐	☐	☐
6076 HVAC	C403.4.5	Mechanical	Condenser heat recovery system that can heat water to 85 ºF or provide 60% of peak heat rejection is installed for preheating of service hot water. []- Exception 1:C403.4.5: Facility operates < 24/7. []- Exception 2:C403.4.5: Total installed heat capacity of water cooled systems <= 6 MMBtu/h of heat rejection. []- Exception 3:C403.4.5: Design SWH load <= 1 MMBtu/h. []- Exception 4:C403.4.5: Facilities using condenser heat recovery for space heating with heat recovery exceeding 30% of the peak water-cooled condenser load. []- Exception 5:C403.4.5: Facilities providing 60% of their service water heating from site-solar, site-recovered, or other energy sources.	☐	☐	☐
6080 HVAC	C403.4.6	Mechanical	Hot gas bypass limited to: <=240 kBtu/h – 50%; <240 kBtu/h – 25%	☐	☐	☐
6101 HVAC	C404.2	Mechanical	Service water heating equipment meets efficiency requirements.	☐	☐	☐
6113 HVAC	C404.3	Mechanical	Heat traps installed on supply and discharge piping of non-circulating systems. []- Exception 1:C404.3: Tank inlets/outlets associated with solar water heating systems. []- Exception 2:C404.3: Requirement does not apply.	☐	☐	☐
6115 HVAC	C404.6.1	Mechanical	Controls are installed that limit the operation of a recirculation pump installed to maintain temperature of a storage tank. System return pipe is a dedicated return pipe or a cold water supply pipe. []- Exception 1:C404.6.1: Requirement does not apply.	☐	☐	☐
6010 HVAC	C404.6.1, C404.6.2	Mechanical	Automatic time switches installed to automatically switch off the recirculating hot-water system or heat trace.	☐	☐	☐
6126 HVAC	C404.9.1	Mechanical	Pool heaters are equipped with on/off switch and no continuously burning pilot light.	☐	☐	☐

6127 HVAC	C404.9.2	Mechanical	Time switches are installed on all pool heaters and pumps. []- Exception 1:C404.9.2: Where 24-hr pump operation required for public health. []- Exception 2:C404.9.2: Solar and waste heat recovery pool heating pumps. []- Exception 3:C404.9.2: Requirement does not apply.	☐ ☐ ☐
6130 HVAC	C404.9.3	Mechanical	Vapor retardant pool covers are provided for heated pools and permanently installed spas. []- Exception 1:C404.9.3: Pools deriving > 75% of the energy for heating (of not fewer than 3 months) from heat pump or site-recovered energy. []- Exception 2:C404.9.3: Requirement does not apply.	☐ ☐ ☐
6054 Controls	C405.2.1, C405.2.1.1	Interior Lighting	Occupancy sensors installed in classrooms/lecture/training rooms, conference/meeting/multipurpose rooms, copy/print rooms, lounges/breakrooms, enclosed offices, open plan office areas, restrooms, storage rooms, locker rooms, corridors, warehouse storage areas, and other spaces <= 300 sqft that are enclosed by floor-to-ceiling height partitions. Reference section language C405.2.1.2 for control function in warehouses and section C405.2.1.3 for open plan office spaces. []- Exception 1:C405.2.1_C405.2.1.1: Automatic-on controls are allowed in corridors, stairways, restrooms, primary building entrance areas and lobbies, and areas where manual-on controls could impact safety or security. []- Exception 2:C405.2.1_C405.2.1.1: Areas such as security or emergency areas that need continuous lighting. []- Exception 3:C405.2.1_C405.2.1.1: Emergency egress lighting. []- Exception 4:C405.2.1_C405.2.1.1: Lighting that is related to means of egress in stairways, ramps, corridors. []- Exception 5:C405.2.1_C405.2.1.1: Requirement does not apply.	☐ ☐ ☐
6063 Controls	C405.2.1.2	Interior Lighting	Occupancy sensors control function in warehouses: In warehouses, the lighting in aisleways and open areas is controlled with occupant sensors that automatically reduce lighting power by 50% or more within 20 minutes of when the areas are unoccupied. The occupant sensors control lighting in each aisleway independently and do not control lighting beyond the aisleway being controlled by the sensor. Lights not turned off by occupant sensors is done so by time-switch. []- Exception 1:C402.5.1.2: Requirement does not apply.	☐ ☐ ☐

6066 Controls	C405.2.1.3	Interior Lighting	Occupant sensor control function in open plan office areas: Occupant sensor controls in open office spaces >= 300 sq.ft. have controls 1) configured so that general lighting can be controlled separately in control zones with floor areas <= 600 sq.ft. within the space, 2) general lighting in each zone permitted to turn on upon occupancy in control zone, 3) automatically turn off general lighting in all control zones within 20 minutes after all occupants have left the space, 4) are configured so that general lighting power in each control zone is reduced by <= 80% of the full zone general lighting power within 20 minutes of all occupants leaving that control zone. []- Exception 1:C405.2.1.3: Requirement does not apply.	☐ ☐ ☐
6067 Controls	C405.2.2, C405.2.2.1	Interior Lighting	Each area not served by occupancy sensors (per C405.2.1.1) have time-switch controls and functions detailed in sections C405.2.2.1. []- Exception 1:C405.2.2_C405.2.2.1: Luminaires requiring specific controls in accordance with C405.2.4. []- Exception 2:C405.2.2_C405.2.2.1: Spaces with patient care. []- Exception 3:C405.2.2_C405.2.2.1: Areas such as security or emergency areas that need continuous lighting. []- Exception 4:C405.2.2_C405.2.2.1: Lighting that is related to means of egress in stairways, ramps, corridors, or emergency routes. []- Exception 5:C405.2.2_C405.2.2.1: Shop and laboratory classrooms.	☐ ☐ ☐
6069 Controls	C405.2.3.1	Interior Lighting	Spaces required to have light-reduction controls have a manual control that allows the occupant to reduce the connected lighting load in a reasonably uniform illumination pattern using one of the following or another approved method: (1) Continuous dimming of all luminaires from full output to less than 20 percent of full power, (2) Switching all luminaires to a reduced output of not less than 30 percent and not more than 70 percent of full power, or (3) Switching alternate luminaires or alternate rows of luminaires to achieve a reduced output of not less than 30 percent and not more than 70 percent of full power. []- Exception 1:C405.2: Areas designated as security or emergency areas that are required to be continuously lighted. []- Exception 2:C405.2: Interior exit stairways, interior exit ramps, and exit passageways. []- Exception 3:C405.2: Emergency egress lighting that is normally off.	☐ ☐ ☐

6070 Controls	C405.2.4, C405.2.4.1, C405.2.4.2	Interior Lighting	Daylight zones provided with individual controls that control the lights independent of general area lighting. See code section C405.2.3 Daylight-responsive controls for applicable spaces, C405.2.3.1 Daylight responsive control function and section C405.2.3.2 Sidelit zone. []- Exception 1:C405.2.4: Spaces where health patient care is directly provided. []- Exception 2:C405.2.4: Lighting required to have specific application controls. []- Exception 3:C405.2.4: Sidelit zones on first floor in Group A-2 and M occupancies. []- Exception 4:C405.2.4: New buildings having total connected lighting power <= the adjusted interior lighting powered allowance (LPA adj, refer to section details and formula). []- Exception 5:C405.2.4: Requirement does not apply.	☐	☐	☐
6074 Wattage	C405.2.5	Interior Lighting	Additional interior lighting power allowed for special functions per the approved lighting plans and is automatically controlled and separated from general lighting. []- Exception 1:C405.7: Air-over electric motors. []- Exception 2:C405.7: Component sets of an electric motor. []- Exception 3:C405.7: Liquid-cooled electric motors. []- Exception 4:C405.7: Submersible electric motors. []- Exception 5:C405.7: Inverter-only electric motors. []- Exception 6:C405.7: Requirement does not apply.	☐	☐	☐
6077 Controls	C405.2.7	Exterior Lighting	Automatic lighting controls for exterior lighting installed. Controls will be daylight controlled, set based on business operation time-of-day, or reduce connected lighting > 50%. []- Exception 1:C405.2.7: Lighting for covered vehicle entrances and exits from buildings and parking structures where required for eye adaptation []- Exception 2:C405.2.7: Lighting controlled from within dwelling units []- Exception 3:C405.2.7: Requirement does not apply.	☐	☐	☐
6131 Wattage	C405.4.1	Exterior Lighting	Exterior lighting power is consistent with what is shown on the approved lighting plans, demonstrating proposed watts are less than or equal to allowed watts.	☐	☐	☐
6132 Mandatory Additior	C406.10	Project	Energy Monitoring - the building is equipped with an energy management system to monitor, record, and report energy consumption for electrical energy, by end-use category, contain meters, a data acquisition system and employ graphical reports.	☐	☐	☐

6133 Mandatory Additior	C406.11	Project	Fault Detection and Diagnostics - a fault detection and diagnostics system installed to monitor the HVAC operation and performance. Includes monitoring sensors and devices, sampling every 15 minutes, automatically report faults and provide recommendations for repair, and transmit recommendations to local authorized personnel.	☐	☐	☐
6134 Mandatory Additior	C406.12	Project	Efficient Kitchen Equipment - the commercial kitchen has at least one fryer with all fryers, dishwashers, steam cookers and ovens complying with performance requirements of Tables C406.12(1) through C406.12(4).	☐	☐	☐
6185 Mandatory Additior	C406.2	Project	Equipment shall exceed the minimum efficiency requirements listed in Tables C403.2.3(1) through C403.2.3(7) by 10 %, in addition to the requirements of Section C403	☐	☐	☐
6135 Mandatory Additior	C406.2.1	Project	5% heating efficiency improvement - all HVAC and Plant heating equipment is 5% more efficient than required by 2021 IECC.	☐	☐	☐
6136 Mandatory Additior	C406.2.2	Project	5% cooling efficiency improvement - all HVAC and Plant cooling equipment is 5% more efficient than required by 2021 IECC.	☐	☐	☐
6137 Mandatory Additior	C406.2.3	Project	10% heating efficiency improvement - all HVAC and Plant heating equipment is 10% more efficient than required by 2021 IECC.	☐	☐	☐
6138 Mandatory Additior	C406.2.4	Project	10% cooling efficiency improvement - all HVAC and Plant cooling equipment is 10% more efficient than required by 2021 IECC.	☐	☐	☐
6139 Mandatory Additior	C406.3	Project	Reduced lighting power - this credit specifies that the connected lighting power is <= 10% more efficient than 2021 IECC requirements.	☐	☐	☐
6140 Mandatory Additior	C406.4	Project	Enhanced Digital Lighting Controls - Interior lighting has the following enhanced lighting controls in accordance with Sections C405.2.1 through C405.2.3, Luminaires capable of continuous dimming and being addressed individually, at least 8 luminaires controlled in combination in a daylight zone, digital control system for fixtures with load shedding or occupancy sensors, Sequence of Operations documentation, and functional testing per Section C408.	☐	☐	☐
6143 Mandatory Additior	C406.5	Project	On-site renewable energy credits - on-site renewable energy system supplies at least 1.71 Btuh or 0.5 watts per square foot of conditioned floor area OR provides at least 2 percent of the energy used within the building for mechanical and service water heating equipment and lighting regulated in Chapter 4.	☐	☐	☐
6145 Mandatory Additior	C406.7.1	Project	Reduced energy use in service water heating - the hot water system contains waste heat recovery from service hot water, heat-recovery chillers, building equipment or process equipment or on-site renewable energy for water heating.	☐	☐	☐
6146 Mandatory Additior	C406.7.3	Project	Reduced energy use in service water heating - the hot water heating system shall have a capacity weighted average fossil fuel water heating efficiency at least 95 thermal efficiency or 0.95 EF.	☐	☐	☐

6147 Mandatory Additior	C406.7.4	Project	Reduced energy use in service water heating - the hot water system is served by heat pump water heaters with a minimum Energy Factor of 3.0. The heat pump does not draw conditioned air from within the building.	☐	☐	☐
6148 Mandatory Additior	C406.8	Project	Enhanced envelope performance - the building thermal envelope UA value is >= 15% better than the total UA of the envelope specified by Section C402.1.5.	☐	☐	☐
6149 Mandatory Additior	C406.9	Project	Reduced air infiltration energy - the measured air-leakage rate of the building envelope is lower than 0.25 cfm/ft2. Comprehensive report documentation will be submitted to the code official and the building owner. []- Exception 1:C406.9: Building is greater than 250,000 square feet.	☐	☐	☐
6083 HVAC	C408.2.2.1	Mechanical	Air outlets and zone terminal devices have means for air balancing. []- Exception 1:C408.2.2.1: Fans with fan motors of 1 hp (0.74 kW) or less. []- Exception 2:C408.2.2.1: Where throttling results in no greater than 1/3 hp fan horsepower draw above that required if the fan speed were adjusted []- Exception 3:C408.2.2.1: Requirement does not apply.	☐	☐	☐
6153 Testing	C408.2.3.2	Mechanical	HVAC and service water heating control systems have been tested to ensure proper operation, calibration and adjustment of controls.	☐	☐	☐
6104 SYSTEM_SPECIF	Table_C403.2.3b	Mechanical	Heat Rejection Equipment - Propeller or Axial Fan Open-Circuit Cooling Tower: Minimum Efficiency Requirement >=40.2 gpm/hp .	☐	☐	☐
6105 SYSTEM_SPECIF	Table_C403.2.3b	Mechanical	Heat Rejection Equipment - Centrifugal Fan Open-Circuit Cooling Tower: Minimum Efficiency Requirement >=20.0 gpm/hp.	☐	☐	☐
6106 SYSTEM_SPECIF	Table_C403.2.3c	Mechanical	Heat Rejection Equipment - Propeller or Axial Fan Closed-Circuit Cooling Tower: Minimum Efficiency Requirement >=16.1 gpm/hp.	☐	☐	☐
6109 SYSTEM_SPECIF	Table_C403.2.3c	Mechanical	Heat Rejection Equipment - Centrifugal Fan Closed-Circuit Cooling Tower: Minimum Efficiency Requirement >=7.0 gpm/hp	☐	☐	☐
6186 SYSTEM_SPECIF	Table_C403.2.3d	Mechanical	Heat Rejection Equipment - Propeller or Axial Fan Dry Coolers (air-cooled fluid coolers): Minimum Efficiency Requirement >= 4.5 gpm/hp	☐	☐	☐
6111 SYSTEM_SPECIFI	Table_C403.2.3h	Mechanical	Heat Rejection Equipment - Propeller or Axial Evaporative Condenser: Minimum Efficiency Requirement >=134 kBtu/h-hp w/ Ammonia test fluid.	☐	☐	☐
6112 SYSTEM_SPECIFI	Table_C403.2.3h	Mechanical	Heat Rejection Equipment - Centrifugal Evaporative Condenser: Minimum Efficiency Requirement >=110 kBtu/h-hp w/ Ammonia test fluid.	☐	☐	☐
6117 SYSTEM_SPECIFI	Table_C403.2.3h	Mechanical	Heat Rejection Equipment - Propeller or Axial Evaporative Condenser: Minimum Efficiency Requirement >=160 kBtu/h-hp w/ R-448A test fluid.	☐	☐	☐

6119 SYSTEM_SPECIFI	Table_C403.2.3h	Mechanical	Heat Rejection Equipment - Centrifugal Evaporative Condenser: Minimum Efficiency Requirement >=137 kBtu/h-hp w/ R-448A test fluid.	☐ ☐ ☐
6121 SYSTEM_SPECIF	Table_C403.2.3h	Mechanical	Heat Rejection Equipment - Air-Cooled Condensers: Minimum Efficiency Requirement >=176 kBtu/h-hp	☐ ☐ ☐

4. To be checked by Inspector at Project Completion and Prior to Issuance of Certificate of Occupancy

6041 Fenestration	C402.4.2.2	Envelope	Skylights in office, storage, automotive service, manufacturing, non-refrigerated warehouse, retail store, and distribution/sorting area have a measured haze value < 90 percent tested per ASTM D1003 unless designed to exclude direct sunlight. []- Exception 1:C402.4.2.2: Skylights designed to exclude direct sunlight entering the occupied space by the use of fixed or automated baffles, geometry of skylight and well, or optical diffusers. []- Exception 2:C402.4.2.2: Requirement does not apply.	☐ ☐ ☐
6179 Post Construction	C405.1	Project	At least 90% of dwelling unit permanently installed lighting shall have lamp efficacy <= 65 lm/W or luminaires with efficacy <= 45 lm/W or comply with C405.2.4 or C405.3. []- Exception 1:C405.1: Requirement does not apply.	☐ ☐ ☐
6180 Post Construction	C405.11, C405.11.1	Project	50% of 15/20 amp receptacles installed in enclosed offices, conference rooms, copy rooms, break rooms, classrooms and workstations and < 25% of branch circuit feeders for modular furniture will have automatic receptacle control in accordance with C405.11.1. []- Exception 1:C405.11_C405.11.1: Requirement does not apply.	☐ ☐ ☐
6181 Post Construction	C405.12	Project	Buildings with gross conditioned floor area >= 25,000 ft2 will be equipped with a energy monitoring system in compliance with C405.12.1 through C405.12.5. []- Exception 1:C405.12: Requirement does not apply.	☐ ☐ ☐
6079 Post Construction	C405.5.3	Project	Total voltage drop across the combination of feeders and branch circuits <= 5%. []- Exception 1:C405.5.3: Requirement does not apply.	☐ ☐ ☐

6073 Post Construction	C405.6	Project	Low-voltage dry-type distribution electric transformers meet the minimum efficiency requirements of Table C405.6. []- Exception 1:C405.6: Transformers meet the Energy Policy Act of 2005 special purposes exclusions. []- Exception 2:C405.6: Transformers meet the Energy Policy Act of 2005 non-general purpose exclusions. []- Exception 3:C405.6: Transformers meet the Energy Policy Act of 2005 exclusions with multiple voltage taps where the highest tap is >= 20% more than the lowest tap. []- Exception 4:C405.6: Drive transformers. []- Exception 5:C405.6: Rectifier transformers. []- Exception 6:C405.6: Auto-transformers. []- Exception 7:C405.6: Uninterruptible power system transformers. []- Exception 8:C405.6: Impedance transformers. []- Exception 9:C405.6: Regulating transformers. []- Exception 10:C405.6: Sealed and nonventilating transformers. []- Exception 11:C405.6: Machine tool transformers. []- Exception 12:C405.6: Welding transformers. []- Exception 13:C405.6: Grounding transformers. []- Exception 14:C405.6: Testing transformers. []- Exception 15:C405.6: Requirement does not apply.	☐	☐	☐
6075 Post Construction	C405.7	Project	Electric motors meet the minimum efficiency requirements of Tables C405.7(1) through C405.7(4). Efficiency verified through certification under an approved certification program or the equipment efficiency ratings shall be provided by motor manufacturer (where certification programs do not exist).	☐	☐	☐
6078 Post Construction	C405.8.1, C405.8.2	Project	Escalators and moving walks comply with ASME A17.1/CSA B44 and have automatic controls configured to reduce speed to the minimum permitted speed in accordance with ASME A17.1/CSA B44 or applicable local code when not conveying passengers. []- Exception 1:C405.8.1_C405.8.2: A variable voltage drive system that reduces operating voltage in response to light loading is installed. []- Exception 2:C405.9.1_C405.9.2: Requirement does not apply.	☐	☐	☐
6150 Post Construction	C408.1.1	Project	Building operations and maintenance documents will be provided to the owner. Documents will cover manufacturers' information, specifications, programming procedures and means of illustrating to owner how building, equipment and systems are intended to be installed, maintained, and operated.	☐	☐	☐

6151 Post Construction	C408.2.1	Mechanical	Commissioning plan developed by registered design professional or approved agency.	☐	☐	☐
6152 Post Construction	C408.2.3.1	Mechanical	HVAC equipment, systems and system-to-system relationships have been tested to ensure proper operation. []- Exception 1:C408.2.3.1: Unitary or packaged HVAC equipment without supply air economizers.	☐	☐	☐
6154 Post Construction	C408.2.3.3	Mechanical	Economizers have been tested to ensure proper operation.	☐	☐	☐
6156 Post Construction	C408.2.4	Mechanical	Preliminary commissioning report completed and certified by registered design professional or approved agency.	☐	☐	☐
6176 Post Construction	C408.2.5	Mechanical	Furnished HVAC as-built drawings submitted within 90 days of system acceptance.	☐	☐	☐
6018 Post Construction	C408.2.5.2	Mechanical	Furnished Operation and Maintenance manuals for HVAC systems within 90 days of system acceptance.	☐	☐	☐
6182 Post Construction	C408.2.5.3	Mechanical	An air and/or hydronic system balancing report is provided for HVAC systems.	☐	☐	☐
6183 Post Construction	C408.2.5.4	Mechanical	Final commissioning report due to building owner within 90 days of receipt of certificate of occupancy.	☐	☐	☐
6184 Post Construction	C408.3	Interior Lighting	Lighting systems have been tested to ensure proper calibration, adjustment, programming, and operation.	☐	☐	☐
6177 Post Construction	C408.3.2	Interior Lighting	Furnished as-built drawings for electric power systems within 90 days of system acceptance.	☐	☐	☐
6017 Post Construction	C408.3.2.2	Interior Lighting	Furnished operation and maintenance manual for lighting equipment and lighting controls provided to the building owner or designated representative.	☐	☐	☐

Input Data Report

Project Information

Project Name: 2024-075 Trinity UMC **Project Title:** Trinity United Methodist Church Addition

Address: 4400 W 19th Street **State:** FL **Zip:** 0

Owner:

Building Type: Religious Building **Building Classification:** New Finished building

No.of Stories: 1 **GrossArea (SF):** 2,420

Bldg. Rotation: None

Zones

No	Acronym	Description	Type	Area [sf]	Multi	Total Area [sf]	
1	AHU-4	Zone 1	CONDITIONED	1620.0	1	1620.0	
2	AHU-5	Zone 2	CONDITIONED	800.0	1	800.0	

Spaces

No	Acronym	Description	Type	Depth [ft]	Width [ft]	Height [ft]	Mult	Total Area [sf]	Total Vol[cf]	
In Zone:	**AHU-4**									
1	101 Meeting	Zo0Sp1	Conference/meeting (Multiple Functions)	10.00	48.00	10.00	1	480.0	4800.0	☐
2	102 Office	Zo0Sp2	Office - Enclosed	10.00	10.00	10.00	1	100.0	1000.0	☐
3	103 Office	Zo0Sp2	Office - Enclosed	10.00	10.00	10.00	1	100.0	1000.0	☐
4	104 Mech	Zo0Sp4	Electrical Mechanical Equipment Room - General	10.00	5.00	10.00	1	50.0	500.0	☐
5	105 Shower	Zo0Sp5	Toilet and Washroom	10.00	6.00	10.00	1	60.0	600.0	☐
6	106 Shower	Zo0Sp6	Toilet and Washroom	10.00	5.00	10.00	1	50.0	500.0	☐
7	107 Laundry	Zo0Sp7	Storage & Warehouse - Inactive Storage	10.00	6.00	10.00	1	60.0	600.0	☐
8	108 RR	Zo0Sp8	Toilet and Washroom	10.00	4.00	10.00	1	40.0	400.0	☐
9	109 RR	Zo0Sp9	Toilet and Washroom	10.00	4.00	10.00	1	40.0	400.0	☐
10	111 Office	Zo0Sp10	Office - Enclosed	10.00	14.00	10.00	1	140.0	1400.0	☐
11	112 Office	Zo0Sp10	Office - Enclosed	10.00	12.00	10.00	1	120.0	1200.0	☐
12	113 Office	Zo0Sp10	Office - Enclosed	10.00	12.00	10.00	1	120.0	1200.0	☐
13	114 Shared Offic	Zo0Sp10	Office - Enclosed	10.00	11.00	10.00	1	110.0	1100.0	☐
14	115 Shared Offic	Zo0Sp10	Office - Enclosed	10.00	15.00	10.00	1	150.0	1500.0	☐
In Zone:	**AHU-5**									
1	118 Kitchen	Zo0Sp1	Food Service - Kitchen	10.00	72.00	10.00	1	720.0	7200.0	☐
2	116 Storage	Zo0Sp2	Storage & Warehouse - Inactive Storage	10.00	4.00	10.00	1	40.0	400.0	☐
3	117 Storage	Zo0Sp2	Storage & Warehouse - Inactive Storage	10.00	4.00	10.00	1	40.0	400.0	☐

Lighting

No	Type	Category	No. of Luminaires	Watts per Luminaire	Power [W]	Control Type	
In Zone:	**AHU-4**						
	In Space: **101 Meeting**						
1	LED	General Lighting	10	19	190	Manual (Local Control)-Manual (Local Control) Occupancy Sensor - Manual ON only-Occupancy Sensor - Manual ON only Occupant Sensor Auto Full OFF-Occupant Sensor Auto Full OFF	☐
	In Space: **102 Office**						
1	LED	General Lighting	4	14	56	Manual (Local Control)-Manual (Local Control) Occupancy Sensor - Manual ON only-Occupancy Sensor - Manual ON only Occupant Sensor Auto Full OFF-Occupant Sensor Auto Full OFF	☐
	In Space: **103 Office**						
1	LED	General Lighting	4	14	56	Manual (Local Control)-Manual (Local Control) Occupancy Sensor - Manual ON only-Occupancy Sensor - Manual ON only Occupant Sensor Auto Full OFF-Occupant Sensor Auto Full OFF	☐
	In Space: **104 Mech**						
1	LED	General Lighting	1	33	33	Manual (Local Control)-Manual (Local Control) Occupancy Sensor - Manual ON only-Occupancy Sensor - Manual ON only Occupant Sensor Auto Full OFF-Occupant Sensor Auto Full OFF	☐
	In Space: **105 Shower**						

1	LED		General Lighting	1	3	3	Manual (Local Control)-Manual (Local Control) Occupant Sensor (50%)-Occupant Sensor (50%) Occupant Sensor Auto Full OFF-Occupant Sensor Auto Full OFF	☐
2	LED		General Lighting	2	14	28	None	☐
	In Space:	**106 Shower**						
1	LED		General Lighting	1	3	3	Manual (Local Control)-Manual (Local Control) Occupant Sensor (50%)-Occupant Sensor (50%) Occupant Sensor Auto Full OFF-Occupant Sensor Auto Full OFF	☐
2	LED		General Lighting	1	19	19	None	☐
3	LED		General Lighting	1	19	19	None	☐
	In Space:	**107 Laundry**						
1	LED		General Lighting	1	20	20	Manual (Local Control)-Manual (Local Control) Occupant Sensor Auto OFF (Full or Partial)-Occupant Sensor Auto OFF (Full or Partial) Time-Switch: Auto Full Off or Scheduled Off-Time-Switch: Auto Full Off or Scheduled Off	☐
	In Space:	**108 RR**						
1	LED		General Lighting	1	3	3	Manual (Local Control)-Manual (Local Control) Occupant Sensor (50%)-Occupant Sensor (50%) Occupant Sensor Auto Full OFF-Occupant Sensor Auto Full OFF	☐
2	LED		General Lighting	1	19	19	None	☐
	In Space:	**109 RR**						
1	LED		General Lighting	1	3	3	Manual (Local Control)-Manual (Local Control) Occupant Sensor (50%)-Occupant Sensor (50%) Occupant Sensor Auto Full OFF-Occupant Sensor Auto Full OFF	☐

2	LED		General Lighting	1	19	19	None	☐
In Space:	**111 Office**							
1	LED		General Lighting	4	14	56	Manual (Local Control)-Manual (Local Control) Occupancy Sensor - Manual ON only-Occupancy Sensor - Manual ON only Occupant Sensor Auto Full OFF-Occupant Sensor Auto Full OFF	☐
In Space:	**112 Office**							
1	LED		General Lighting	4	14	56	Manual (Local Control)-Manual (Local Control) Occupancy Sensor - Manual ON only-Occupancy Sensor - Manual ON only Occupant Sensor Auto Full OFF-Occupant Sensor Auto Full OFF	☐
In Space:	**113 Office**							
1	LED		General Lighting	4	14	56	Manual (Local Control)-Manual (Local Control) Occupancy Sensor - Manual ON only-Occupancy Sensor - Manual ON only Occupant Sensor Auto Full OFF-Occupant Sensor Auto Full OFF	☐
In Space:	**114 Shared Office**							
1	LED		General Lighting	4	14	56	Manual (Local Control)-Manual (Local Control) Occupancy Sensor - Manual ON only-Occupancy Sensor - Manual ON only Occupant Sensor Auto Full OFF-Occupant Sensor Auto Full OFF	☐
In Space:	**115 Shared Office**							
1	LED		General Lighting	4	14	56	Manual (Local Control)-Manual (Local Control) Occupancy Sensor - Manual ON only-Occupancy Sensor - Manual ON only Occupant Sensor Auto Full OFF-Occupant Sensor Auto Full OFF	☐
In Zone:	**AHU-5**							
In Space:	**118 Kitchen**							

1	LED		General Lighting	8	19	152	Manual (Local Control)-Manual (Local Control) Occupancy Sensor - Manual ON only-Occupancy Sensor - Manual ON only Light Reduction (30%-70%)-Light Reduction (30%-70%) Time-Switch: Auto Full Off or Scheduled Off-Time-Switch: Auto Full Off or Scheduled Off	☐
2	LED		General Lighting	8	14	112	None	☐
	In Space:	**116 Storage**						
1	LED		General Lighting	1	10	10	Manual (Local Control)-Manual (Local Control) Occupant Sensor Auto OFF (Full or Partial)-Occupant Sensor Auto OFF (Full or Partial) Time-Switch: Auto Full Off or Scheduled Off-Time-Switch: Auto Full Off or Scheduled Off	☐
	In Space:	**117 Storage**						
1	LED		General Lighting	1	10	10	Manual (Local Control)-Manual (Local Control) Occupant Sensor Auto OFF (Full or Partial)-Occupant Sensor Auto OFF (Full or Partial) Time-Switch: Auto Full Off or Scheduled Off-Time-Switch: Auto Full Off or Scheduled Off	☐

Walls (Walls will be rotated clockwise by building rotation value)

No	Description	Type	Width [ft]	H (Effec) [ft]	Multi plier	Area [sf]	Orient ation	Cond- uctance [Btu/h.sf.F]	Heat Capacity [Btu/sf.F]	Dens. [lb/cf]	R-Value [h.sf.F/Btu]	
In Zone:	**AHU-4**											
1	Pr0Zo1Wa1	CMU with Polyiso. Gyp and Face brick.	38.00	10.00	1	380.0	North	0.0800	2.890	24.90	12.5	☐
2	Pr0Zo1Wa1	CMU with Polyiso. Gyp and Face brick.	82.00	10.00	1	820.0	West	0.0800	2.890	24.90	12.5	☐
3	Pr0Zo1Wa1	CMU with Polyiso. Gyp and Face brick.	59.00	10.00	1	590.0	South	0.0800	2.890	24.90	12.5	☐
In Zone:	**AHU-5**											
1	Pr0Zo1Wa1	CMU with Polyiso. Gyp and Face brick.	20.00	10.00	1	200.0	North	0.0800	2.890	24.90	12.5	☐

Windows (Windows will be rotated clockwise by building rotation value)

No	Description	Orientation	Shaded	U [Btu/hr sf F]	SHGC	Vis.Tra	W [ft]	H (Effec) [ft]	Multi plier	Total Area [sf]	
In Zone:	**AHU-4**										
	In Wall:	**N Typ New Wall**									
1	Pr0Zo1Wa3Wi1	North	No	0.6000	0.59	0.64	2.33	6.00	4	55.9	☐
	In Wall:	**S Typ New Wall**									
1	Pr0Zo1Wa3Wi1	South	No	0.6000	0.59	0.64	2.33	6.00	10	139.8	☐
	In Wall:	**W Typ New Wall**									
1	Pr0Zo1Wa3Wi1	West	No	0.6000	0.59	0.64	2.33	6.00	3	41.9	☐
In Zone:	**AHU-5**										
	In Wall:	**N Typ New Wall**									
1	Pr0Zo2Wa1Wi1	North	No	0.6000	0.59	0.64	3.00	3.33	1	10.0	☐

Doors

No	Description	Type	Shade?	Width [ft]	H (Effec) [ft]	Multi plier	Area [sf]	Cond. [Btu/h.sf.F]	Dens. [lb/cf]	Ht Cap. [Btu/sf. F]	R [h.sf.F/ Btu]	
In Zone: AHU-4												
In Wall: N Typ New Wall												
1	Pr0Zo1Wa1Dr1	Solid core flush (2.25)	No	7.00	3.00	1	21.0	0.3504	0.00	0.00	2.85	
In Wall: W Typ New Wall												
1	Pr0Zo1Wa1Dr1	Solid core flush (2.25)	No	7.00	3.00	2	21.0	0.3504	0.00	0.00	2.85	

Roofs

No	Description	Type	Width [ft]	H (Effec) [ft]	Multi plier	Area [sf]	Tilt [deg]	Cond. [Btu/h.Sf. F]	Heat Cap [Btu/sf. F]	Dens. [lb/cf]	R-Value [h.sf.F/Btu	
In Zone: AHU-4												
1	Pr0Zo1Rf1	R-38 Sprayfoam on Plywood Deck	103.00	10.00	1	1030.0	14.00	0.0800	2.89	5.00	12.5	
2	Pr0Zo1Rf2	R-38 Sprayfoam on Plywood Deck	122.00	10.00	1	1220.0	14.00	0.0800	2.89	5.00	12.5	
In Zone: AHU-5												
1	Pr0Zo1Rf1	R-38 Sprayfoam on Plywood Deck	69.00	10.00	1	690.0	14.00	0.0800	2.89	5.00	12.5	
2	Pr0Zo1Rf2	R-38 Sprayfoam on Plywood Deck	14.00	10.00	1	140.0	14.00	0.0800	2.89	5.00	12.5	

Skylights

No	Description	Type	U [Btu/hr sf F]	SHGC	Vis.Trans	W [ft]	H (Effec) [ft]	Multi-plier	Area [Sf]	Total Area [Sf]	
In Zone:											
In Roof:											

Floors

No	Description	Type	Width [ft]	H (Effec) [ft]	Multi plier	Area [sf]	Cond. [Btu/h.sf.F	Heat Cap. [Btu/sf. F]	Dens. [lb/cf]	R-Value [h.sf.F/Btu	
In Zone:	**AHU-4**										
1	Pr0Zo1Fl1	1 ft. soil, concrete floor, carpet and rubber pad	217.00	10.00	1	2170.0	0.2681	34.00	113.33	3.73	☐
In Zone:	**AHU-5**										
1	Pr0Zo1Fl1	1 ft. soil, concrete floor, carpet and rubber pad	81.00	10.00	1	810.0	0.2681	34.00	113.33	3.73	☐

Systems

AHU-4 **System 1** **Constant Volume Air Cooled Split System < 65000 Btu/hr** **No. Of Units** **1**

Component	Category	Capacity	Efficiency	IPLV	
1	Cooling System	60000.00	14.30	8.00	☐
2	Heating System	52500.00	7.50		☐
3	Air Handling System -Supply	1750.00	0.32		☐

AHU-5 **System 2** **Constant Volume Air Cooled Split System < 65000 Btu/hr** **No. Of Units** **1**

Component	Category	Capacity	Efficiency	IPLV	
1	Cooling System	18000.00	15.20	8.00	☐
2	Heating System	17800.00	7.50		☐
3	Air Handling System -Supply	605.00	0.62		☐

Plant

Equipment	Category	Size	Inst.NoEff.	IPLV

Water Heaters

	W-Heater Description	Capacity	Cap.Unit	I/P Rt.	Efficiency	Loss	
1	Gas Instantaneous water heater (2 units)		[Gal]	199000 [Btu/h]	0.9700 [Ef/Et]	[Btu/h]	☐

Ext-Lighting

	Description	Category	No. of Lumin-aires	Watts per Lumin-aire	Area/Len/No [sf/ft/No]	Control Type	Wattage [W]	
1	Ext Light 1	Building facades (by linear foot)	6	36	177.00	Astronomical Timer C	216.00	☐

Piping

No	Type	Operating Temp [F]	Insulation Conductivity [Btu-in/h.sf.F]	Nomonal pipe Diameter [in]	Insulation Thickness [in]	Is Runout?	
1	Heating System (Steam, Steam Condensate, & Hot Water)	139.00	0.28	1.00	1.50	No	☐

Fenestration Used

Name	Glass Type	No. of Panes	Glass Conductance [Btu/h.sf.F]	SHGC	VLT
ASHULDblClrWd-Vy-Fg frm	User Defined	2	0.6000	0.5900	0.6400

Materials Used

Mat No	Acronym	Description	Only R-Value Used	RValue [h.sf.F/Btu]	Thick [ft]	Cond-uctivity [Btu/h.ft.F	Density [lb/cf]	Sp. Heat [Btu/lb.F]	
178	Matl178	CARPET W/RUBBER PAD	Yes	1.2300					☐
265	Matl265	Soil, 1 ft	No	2.0000	1.0000	0.5000	100.00	0.2000	☐
48	Matl48	6 in. Heavyweight concrete	No	0.5000	0.5000	1.0000	140.00	0.2000	☐
279	Matl279	Solid core flush (2.25")	Yes	2.8537					☐

Constructs Used

No	Name	Simple Construct	Massless Construct	Conductance [Btu/h.sf.F]	Heat Cap [Btu/sf.F]	Density [lb/cf]	RValue [h.sf.F/Btu]	
1057	1 ft. soil, concrete floor, carpet and rubber pad	No	No	0.27	34.00	113.33	3.7	☐

Layer	Material No.	Material	Thickness [ft]	Framing Factor	
1	265	Soil, 1 ft	1.0000	0.000	☐
2	48	6 in. Heavyweight concrete	0.5000	0.000	☐
3	178	CARPET W/RUBBER PAD		0.000	☐

No	Name	Simple Construct	Massless Construct	Conductance [Btu/h.sf.F]	Heat Cap [Btu/sf.F]	Density [lb/cf]	RValue [h.sf.F/Btu]	
1058	Solid core flush (2.25)	No	Yes	0.35			2.9	☐

Layer	Material No.	Material	Thickness [ft]	Framing Factor	
1	279	Solid core flush (2.25")		0.000	☐

No	Name	Simple Construct	Massless Construct	Conductance [Btu/h.sf.F]	Heat Cap [Btu/sf.F]	Density [lb/cf]	RValue [h.sf.F/Btu]	
1060	CMU with Polyiso. Gyp and Face brick.	Yes	No	0.08	2.89	24.90	12.5	☐

No	Name	Simple Construct	Massless Construct	Conductance [Btu/h.sf.F]	Heat Cap [Btu/sf.F]	Density [lb/cf]	RValue [h.sf.F/Btu]	
1061	R-38 Sprayfoam on Plywood Deck	Yes	No	0.08	2.89	5.00	12.5	☐

Appendix CA Forms

FLORIDA BUILDING CODE, ENERGY CONSERVATION
CHAPTER C4—COMMERCIAL ENERGY EFFICIENCY

Form C402-2020 ALTERATIONS, RENOVATIONS and BUILDING SYSTEMS

	Climate Zone: 2A		
Project Name: Trinity United Methodist Church	*Occupancy type:* A-3 Religious Assembly		
Address: 4400 W. 19th Street	Alteration X Renovation □ Building System □		
City, Zip Code: Panama City, 32405	*Building Permit No.:*		
Builder:	*Permitting Office:*		
Owner:			

BUILDING ENVELOPE INFORMATION (Where changed)

Envelope Component	Description	Requirement		Efficiency	
		Location	Unit	Required	Installed
Roof type		*Table C402.1.4 or Table C402.1.3*	*≤ U-factor or ≥ R-value*		
Roof reflectance/Emittance (low slope roofs)		*Table C402.3*	*≥ Solar reflectance, ≥ Thermal emittance*		
Wall type, above grade		*Table C402.1.4 or Table C402.1.3*	*≤ U-factor or ≥ R-value*		
Wall, below grade					
Floor type					
Vertical fenestrations		*Table C402.4*	*≤ U-factor*		
			≤ SHGC		
Skylights			*≤ U-factor*		
			≤ SHGC		

BUILDING SYSTEMS INFORMATION [for HVAC, service hot water or pool heating, lighting systems and replacement fenestration (C501.7)]

System	Type (describe system)	Requirement		Efficiency	
		Location	Unit	Required	Installed
Air-conditioning system		*Tables C403.2.3 (1-3, 6-8, 9-11)*	*SEER or EER, IEER*		
Heating system		*Tables C403.2.3 (2-6)*	*HSPF or COP AFUE, E_t or E_c*		
Ventilation/air handling system		*Tables C403.2.12.1(1-2)*	*Fan power (cfm)*		
Ducts	*Location:*	*Table C403.2.9.1*	*R-value*	SEE SPREADSHEET	
Piping	*Fluid design operating temp:*	*Table C403.2.10*	*Inches*		
Hot water		*Table C404.2*	*EF, E_t, COP*		
Lighting	*Space types: (append list)*	*Table C405.3.2 (1 or 2)*	*Lighting power density*	SEE SPREADSHEET	
Fenestrations: Enter information in BUILDING ENVELOPE INFORMATION box above.					
Other:					

COMPLIANCE IS BY ANSI/ASHRAE/IESNA 90.1 □
(Submit alternate form or append documents as needed)

I hereby certify that the plans and specifications covered by this calculation are in compliance with the Florida Building Code, Energy Conservation.
PREPARED BY: IAN BERNANDER
DATE: 02/28/25
I hereby certify that this building is in compliance with the Florida Building Code, Energy Conservation:
OWNER/AGENT: _____
DATE: _____

KEITH A. JOHNSON LICENSE NO. 86457 STATE OF FLORIDA PROFESSIONAL ENGINEER

Review of plans and specifications covered by this calculation indicates compliance with the Florida Building Code, Energy Conservation. Before construction is completed, this building will be inspected for compliance in accordance with Section 553.908, F.S.
BUILDING OFFICIAL: _____
DATE: _____

INTERIOR LIGHTING		
SPACE NUMBER/NAME	101 Living Room	102 Dining Area
SPACE TYPE	Fellowship Hall - Religious	Dining Area - Other
AREA (SQ FT)	2424.00	1100.00
LIGHTS (WATTS)	1118.00	590.00
PROPOSED W/SF	0.46	0.54
REQUIRED W/SF	0.55	0.63
TOTAL ALLOWED WATTS	1333.20	693.00
TOTAL WATTS ALLOWED	2026.20	
TOTAL WATTS INSTALLED	1708.00	

EXTERIOR LIGHTING ZONE 2				
LIGHTING TYPE	CODE REQUIREMENT (C405.4.2(2))	LENGTH/AREA	REQUIRED WATTS	PROPOSED WATTS
Building Façade	0.075W/ft^2	842ft^2	100.00	180.00
BASE ALLOWANCE (WATTS)	400.00			
TOTAL WATTS ALLOWED	500.00			
TOTAL WATTS INSTALLED	180.00			

SYSTEM	TYPE (DESCRIBE SYSTEM)	REQUIREMENT		EFFICIENCY	
		LOCATION	UNIT	REQUIRED	INSTALLED
DUCTS		**TABLE C403.2.9.1**	**R-VALUE**		
SUPPLY	UNVENTED ATTIC WITH ROOF INSULATION	TABLE C403.2.9.1		6	6
RETURN	UNVENTED ATTIC WITH ROOF INSULATION	TABLE C403.2.9.1		4.2	6
PIPING	**FLUID DESIGN OPERATION TEMP.:**	**TABLE C403.2.10**	**INCHES**		
<1-1/2" HOT WATER PIPING	140	TABLE C403.2.10		1	1.5