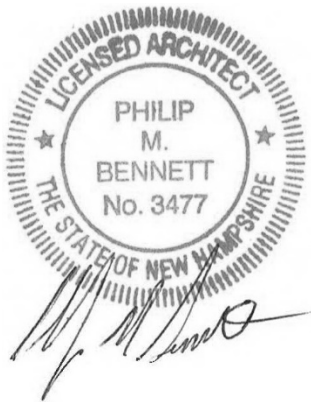


alba architects



alba architects llp

INNOVATION FOR THE BUILT ENVIRONMENT

Alba Architects llp · PO Box 186, 137 Main Street · North Woodstock, NH 03262 · tel: 603.745.4770 · www.albaarchitects.com

WHITEFIELD LIBRARY

PROJECT SPECIFICATIONS — MAY 6, 2026

member of the American Institute of Architects
member of the US Green Building Council

alba architects · a limited liability partnership · stuart j anderson & philip m bennett

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 00 01 02

PROJECT INFORMATION

1. PART 1 GENERAL

1.1. PROJECT IDENTIFICATION

- 1.1.1. Project Name: Whitefield Library, located at: 8 Lancaster Road, Whitefield, NH.
- 1.1.2. The Owner, hereinafter referred to as Whitefield Library: Town of Whitefield
- 1.1.3. Whitefield Library's Representative: Courtney Vashaw.
 - 1.1.3.1. Address: 8 Lancaster Road, Whitefield, NH.
 - 1.1.3.2. Phone/Fax: 1-603-837-2030.
 - 1.1.3.3. E-mail: whitefieldpubliclibrary@gmail.com.

1.2. NOTICE TO PROSPECTIVE BIDDERS

- 1.2.1. These documents constitute an Invitation to Bid to and request for qualifications from General Contractors for the construction of the project described below.

1.3. PROJECT DESCRIPTION

- 1.3.1. Summary Project Description:

The Whitefield Public Library, originally constructed in 1904, is located at 8 Lancaster Road and is one of only nine Carnegie libraries in the State. Situated on almost 1 acre of land the original 1904 section is approximately 1,500 square feet, with a single-story 1,400 square foot addition added in 2011.

The current building is deficient, not only in square footage to sustain the patrons and programs, but many of the building systems and components are antiquated. This includes accessibility, mechanical systems, electrical systems and other criteria desirable for a modern-day functioning library.

The proposed additions renovations will provide, but not limited to, the following:

 - New site access and associated parking from Jeffers
 - New 2-story addition of approximately 4,000 sq.ft. inclusive of:
 - Lower Level - New Community Room, Kitchenette, and Ancillary Spaces.
 - Main Level - New Flex Spaces, Makers Space, Offices and Ancillary Spaces.
 - New Elevator and Staircase.
 - New MEP Systems.
 - Re-arrangement of Spaces within the 2011 addition.
 - Structural re-inforcement of existing systems.
 - New mechanical systems to address humidity and air quality to existing basement.
 - Replacement of Lighting throughout.

Funders at this time include:

 - Northern Border Regional Commission.
 - USDA RD Funding with Build America, Buy America Act (BABA) as a compliance requirement.
- 1.3.2. Contract Scope: Construction, demolition, and renovation.
- 1.3.3. Contract Terms: Lump sum (fixed price, stipulated sum).

1.4. PROJECT CONSULTANTS

- 1.4.1. Owner's Project Manager: Bruss Project Management - Michael Bruss.
 - 1.4.1.1. Phone/Fax: 1-603-344-1552.
 - 1.4.1.2. E-mail: mdbruss17@gmail.com.
- 1.4.2. The Architect, hereinafter referred to as Alba Architects: .
 - 1.4.2.1. Address: 137 Main Street, PO Box 186.
 - 1.4.2.2. City, State, Zip: North Woodstock, NH 03262.
 - 1.4.2.3. Phone/Fax: 1-603-745-4770.
 - 1.4.2.4. E-mail: sanderson@albaarchitects.com.

1.5. PROCUREMENT TIMETABLE

- 1.5.1. Pre-Bid Site Tour: Friday, June 12, 2026 at 10am.
- 1.5.2. Last Request for Substitution Due: 7 days prior to due date of bids.
- 1.5.3. Last Request for Information Due: 7 days prior to due date of bids.
- 1.5.4. Bid Due Date: 06-26-2026, before 4 PM local time.
- 1.5.5. Bid Opening: Same day, 4 PM local time.
- 1.5.6. Notice to Proceed: Within 30 days after due date.
- 1.5.7. Bids May Not Be Withdrawn Until: 30 days after due date.
- 1.5.8. Desired Construction Start: As soon as possible.
- 1.5.9. Anticipated Substantial Completion Date: 12-31-2026.
- 1.5.10. Final Completion date is critical due to requirements of Owner's operations.
- 1.5.11. The Whitefield Library reserves the right to change the schedule or terminate the entire procurement process at any time.

1.6. PROCUREMENT DOCUMENTS

- 1.6.1. Availability of Documents: Complete sets of procurement documents may be obtained:
 - 1.6.1.1. From Whitefield Library at the Project Manager's address listed above.
- 1.6.2. Documents may be viewed at:
 - 1.6.2.1. Whitefield Town Offices - 56 Littleton Road, Whitefield, NH 03598
 - 1.6.2.2. Whitefield Public Library - 8 Lancaster Road, Whitefield, NH 03598

1.7. BID SECURITY

- 1.7.1. Bids shall be accompanied by a security deposit as follows:
 - 1.7.1.1. Bid Bond of a sum no less than 5 percent of the Bid Amount .
 - A. See USDA 1942-A, Guide 19, Attachment 4.

1.8. LIQUIDATED DAMAGES

- 1.8.1. The project shall include liquidated damages (see RD Instruction 1942.18 (n) (1)). Liquidated damages shall be \$250 per day beyond the date of substantial completion.

2. PART 2 PRODUCTS - NOT USED

3. PART 3 EXECUTION - NOT USED

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 00 01 10

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- 00 50 00 - Contracting Forms and Supplements
- 00 63 25 - Substitution Request Form - During Construction
 - RD Instruction 1942-A, Guide 19, Attachment 1⁴
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 - RD Instr.1942-A, Guide 27, Attachment 2
 - RD Instr.1942-A, Guide 19, Attachment 3
 - RD Instr.1942-A, Guide 19, Attachment 4
 - RD 1940-Q, Exhibit A-1
 - RD Instr.1942-A, Guide 19, Attachment 7
 - AIA Document A101-2017 or acceptable alternate AIA agreement¹
 - RD Instr. 1942-A, Guide 27, Attachment 3⁴
 - RD Instr.1942-A, Guide 19, Attach. 6 or acceptable substitute²
 - RD Instr.1942-A, Guide 19, Attach. 5 or acceptable substitute²
 - AIA Document A201-2017
 - RD Instr. 1942-A, Guide 27, Attachment 4⁴
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 - Construction Sign Detail - Rural Development template
 - AIA Document G702/G703 with RD Attachment or Form RD 1924-18
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This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 00 21 13

INSTRUCTIONS TO BIDDERS

1. INVITATION

1.1. BID SUBMISSION

- 1.1.1. Bids signed, executed, and dated will be received at the office of the Town of Whitefield at 56 Littleton Road, Whitefield, NH before 4 p.m. local standard time on 06-26-2026.
- 1.1.2. Offers submitted after the above time will be returned to the bidder unopened.
- 1.1.3. Offers will be opened publicly immediately after the time for receipt of bids.
- 1.1.4. Amendments to the submitted offer will be permitted if received in writing prior to bid closing and if endorsed by the same party or parties who signed and sealed the offer.

1.2. INTENT

- 1.2.1. The intent of this Bid request is to obtain an offer to perform work to complete project named Whitefield Library for a Stipulated Sum contract, in accordance with Contract Documents.

1.3. WORK IDENTIFIED IN THE CONTRACT DOCUMENTS

- 1.3.1. Work of this proposed Contract comprises building construction, site development, remodeling, renovation, and demolition, including general construction, structural, mechanical, and electrical Work.
- 1.3.2. Project Location:

1.4. CONTRACT TIME

- 1.4.1. Whitefield Library requires that under the work of this contract be completed as quickly as possible and consideration will be given to time of completion when reviewing the submitted bids.

2. BID DOCUMENTS AND CONTRACT DOCUMENTS

2.1. DEFINITIONS

- 2.1.1. Bid Documents: Contract Documents supplemented with Invitation To Bid, Instructions to Bidders, Information Available to Bidders, Bid Form Supplements To Bid Forms and Appendices identified.
- 2.1.2. Bid, Offer, or Bidding: Act of submitting an offer.
- 2.1.3. Bid Amount: Monetary sum identified by the Bidder in the Bid Form.

2.2. INQUIRIES/ADDENDA

- 2.2.1. Direct questions to Bruss Project Management, email; mdbluss17@gmail.com.
- 2.2.2. Addenda may be issued during the bidding period. All Addenda become part of Contract Documents. Include resultant costs in the Bid Amount.
- 2.2.3. Verbal answers are not binding on any party.

- 2.2.4. Clarifications requested by bidders must be in writing not less than 7 days before date set for receipt of bids. The reply will be in the form of an Addendum, a copy of which will be forwarded to known recipients.

2.3. PRODUCT/ASSEMBLY/SYSTEM SUBSTITUTIONS

- 2.3.1. General Requirements for Substitution Requests:
 - 2.3.1.1. Project Manual establishes standards for products, assemblies, and systems.
 - 2.3.1.2. Submit requests only for elements for which substitution is specifically allowed in the Project Manual.
 - A. All products and materials specified can be substituted with products and materials that are equal and approved.
 - 2.3.1.3. Provide sufficient information to determine acceptability of proposed substitutions.
 - 2.3.1.4. Provide complete information on required revisions to other work to accommodate each proposed substitution.
- 2.3.2. Substitution Request Form:
 - 2.3.2.1. Submit substitution requests by completing the form attached to this section. See this form for additional information and instructions. Use only this form; other forms of submission are unacceptable.
- 2.3.3. Review and Acceptance of Request:
 - 2.3.3.1. Alba Architects may approve the proposed substitution and will issue an Addendum to known bidders.
 - 2.3.3.2. For approved substitutions, include representation of changes in the bid, if any, required in the work and changes to Contract Time and Contract Sum to accommodate such substitutions. A later claim by the bidder for an addition to the Contract Time or Contract Sum because of changes in work necessitated by use of substitutions will not be considered.
- 2.3.4. See Section 01 25 00 - Substitution Procedures for additional requirements.

3. SITE ASSESSMENT

3.1. SITE EXAMINATION

- 3.1.1. Examine the project site before submitting a bid.
- 3.1.2. A pre-bid site visit to the project site has been arranged for bidders as follows: Friday, June 12, 2026 at 10am.

4. BID SUBMISSION

4.1. SUBMISSION PROCEDURE

- 4.1.1. Bidders shall be solely responsible for the delivery of their bids in the manner and time prescribed.
- 4.1.2. Electronic Document Submissions:
 - 4.1.2.1. Submit executed offer on Bid Forms provided, signed and sealed, clearly identified with bidder's name and project name.
 - 4.1.2.2. Submit required bid bond using electronic payment method acceptable to Whitefield Library.
- 4.1.3. Improperly completed information or irregularities in security deposit may be cause to reject and declare the bid invalid or informal.

4.2. BID INELIGIBILITY

- 4.2.1. Bids that are unsigned, improperly signed or sealed, conditional, illegible, obscure, contain arithmetical errors, erasures, alterations, or irregularities of any kind, may at the discretion of the Whitefield Library, be declared unacceptable.
- 4.2.2. Bid Forms, Appendices, and enclosures that are improperly prepared may, at the discretion of Whitefield Library, be declared unacceptable.
- 4.2.3. Failure to provide security deposit, bonding or insurance requirements may, at the discretion of Whitefield Library, invalidate the bid.

5. BID ENCLOSURES/REQUIREMENTS

5.1. SECURITY DEPOSIT

- 5.1.1. Bids shall be accompanied by a security deposit as follows:
 - 5.1.1.1. Bid Bond of a sum no less than 5 percent of the Bid Amount.
- 5.1.2. Endorse the Bid Bond in the name of the Whitefield Library as obligee, signed and sealed by the principal (Contractor) and surety.
- 5.1.3. The security deposit will be returned after delivery to the Whitefield Library of the required Performance and Payment Bond(s) by the accepted bidder.
- 5.1.4. Include the cost of bid security in the Bid Amount.
- 5.1.5. After a bid has been accepted, all securities will be returned to the respective bidders and other requested enclosures.
- 5.1.6. If no contract is awarded, all security deposits will be returned.

5.2. PERFORMANCE ASSURANCE

- 5.2.1. Accepted Bidder: Provide a Performance and Payment bond as described in 00 73 00 - Supplementary Conditions.
- 5.2.2. Include the cost of Performance and Payment Bonds in the Bid Amount.

5.3. BID FORM REQUIREMENTS

- 5.3.1. Complete all requested information in the Bid Form and Appendices.

5.4. FEES FOR CHANGES IN THE WORK

- 5.4.1. Include in the Bid Form, the overhead and profit fees on own Work and Work by subcontractors, applicable for Changes in the Work, whether additions to or deductions from the Work on which the Bid Amount is based.
- 5.4.2. Include in the Bid Form, the fees proposed for subcontract work for changes (both additions and deductions) in the Work. Contractor shall apply fees as noted, to the subcontractor's gross (net plus fee) costs on additional work.

5.5. BID FORM SIGNATURE

- 5.5.1. The Bid Form shall be signed by the bidder, as follows:
 - 5.5.1.1. Sole Proprietorship: Signature of sole proprietor in the presence of a witness who will also sign. Insert the words "Sole Proprietor" under the signature. Affix seal.
 - 5.5.1.2. Partnership: Signature of all partners in the presence of a witness who will also sign. Insert the word "Partner" under each signature. Affix seal to each signature.
 - 5.5.1.3. Corporation: Signature of a duly authorized signing officer(s) in their normal signatures. Insert the officer's capacity in which the signing officer acts, under each signature. Affix the corporate seal. If the bid is signed by officials other than the president and

secretary of the company, or the president/secretary/treasurer of the company, a copy of the by-law resolution of their board of directors authorizing them to do so, must also be submitted with the Bid Form in the bid envelope.

6. OFFER ACCEPTANCE/REJECTION

6.1. DURATION OF OFFER

6.1.1. Bids shall remain open to acceptance and shall be irrevocable for a period of thirty (30) days after the bid closing date.

6.2. ACCEPTANCE OF OFFER

6.2.1. Whitefield Library reserves the right to accept or reject any or all offers.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 00 41 00

Also see USDA 1942-A, Guide 19, Attachment 3.

BID FORM

1.THE PROJECT AND THE PARTIES

1.1. TO:

1.1.1. The Town of Whitefield

1.2. FOR:

1.2.1. Project: Whitefield Library
8 Lancaster Road
Whitefield, New Hampshire 03598

1.3. DATE: _____ (bidder to enter date)

1.4. SUBMITTED BY: (BIDDER TO ENTER NAME AND ADDRESS)

1.4.1. Bidder's Full Name _____
Address _____
City, State, Zip _____

1.5. OFFER

1.5.1. Having examined the Place of The Work and all matters referred to in the Instructions to Bidders and the Bid Documents prepared by Alba Architects for the above mentioned project, we, the undersigned, hereby offer to enter into a Contract to perform the Work for the Sum of:

1.5.2. _____ dollars
(\$ _____), in lawful money of the United States of America.

1.6. ACCEPTANCE

1.6.1. This offer shall be open to acceptance and is irrevocable for thirty days from the bid closing date.

1.7. CONTRACT TIME

1.7.1. If this Bid is accepted, we will complete all work on or before December 31, 2026.
1.7.2. The project shall include liquidated damages (see RD Instruction 1942.18 (n) (1)). Liquidated damages shall be \$250 per day beyond the date of substantial completion.

1.8. BID PRICES

1.8.1. Bidder must present the line items noted in a readily understandable format. All bidders are to carry to pre-established line item allowances as noted below:

Description	Bid Price
General Conditions	
Selective Demolition	
Concrete	
Masonry	
Metals	
Wood, Plastics and Composites	
Thermal and Moisture Protection	
Openings	
Finishes	
Specialties	
Equipment	
Furnishings	
Conveying Equipment	
Plumbing	
Heating, Ventilating and Air-Conditioning	
Electrical	
Communications	
Exterior Improvements / Site Work	
Excavation of Existing Foundation (allowance)	\$20,000.00
Other	
Overhead	
Profit	
Total	

1.9. ALTERNATES

1.9.1. Provide deduct alternate pricing for the following as noted in Section 01 23 00. All materials and products specified can be substituted for materials and products equal and approved.

Alternate No. 1 - Exterior Brick Veneer to New Addition.

Base Bid - Provide all products, components, systems and associated work as identified in Contract Documents.

Alternate - Deduct brick veneer at main level only (vertical area between horizontal trims). Provide Hardie Architectural Panel in lieu of Brick Veneer.

Deduct _____

Alternate No. 2 - Lighting throughout Original 1904 Library.

Base Bid - Provide all fixtures, components, systems and associated work as identified in Contract Documents.

Alternate - Deduct complete lighting scope of work to Original 1904 Library. All existing fixtures, components, and systems to remain.

Deduct _____

Alternate No. 3 - Lighting throughout 2011 Library Addition.

Base Bid - Provide all fixtures, components, systems and associated work as identified in Contract Documents.

Alternate - Deduct complete lighting scope of work to 2011 Library Addition, other than that necessary for the new Study Room. All other existing fixtures, components, and systems to remain.

Deduct _____

1.10. ADDENDA

1.10.1. The following Addenda have been received. The modifications to the Bid Documents noted below have been considered and all costs are included in the Bid Sum.

Addendum # _____ Dated _____.

Addendum # _____ Dated _____.

Addendum # _____ Dated _____.

1.11. BID FORM SIGNATURE(S)

1.11.1. _____
(Authorized signing officer, Title)

2.END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 00 50 00

CONTRACTING FORMS AND SUPPLEMENTS

1. PART 1 GENERAL

1.1. AGREEMENT AND CONDITIONS OF THE CONTRACT

- 1.1.1. The Agreement is based on AIA A101.
- 1.1.2. The General Conditions are based on AIA A201.

1.2. FORMS

- 1.2.1. Use the following forms for the specified purposes unless otherwise indicated elsewhere in Contract Documents.
- 1.2.2. Post-Award Certificates and Other Forms:
 - 1.2.2.1. Schedule of Values Form: AIA G703.
 - 1.2.2.2. Application for Payment Forms: AIA G702 with AIA G703 (for Contractors).
- 1.2.3. Clarification and Modification Forms:
 - 1.2.3.1. Architect's Supplemental Instructions Form: AIA G710.
 - 1.2.3.2. Construction Change Directive Form: AIA G714.
 - 1.2.3.3. Change Order Form: AIA G701.
- 1.2.4. Closeout Forms:
 - 1.2.4.1. Certificate of Substantial Completion Form: AIA G704.

1.3. REFERENCE STANDARDS

- 1.3.1. AIA A101 - Standard Form of Agreement Between Owner and Contractor where the basis of Payment is a Stipulated Sum; 2017.
- 1.3.2. AIA G701 - Change Order; 2017.
- 1.3.3. AIA G702 - Application and Certificate for Payment; 1992.
- 1.3.4. AIA G703 - Continuation Sheet; 1992.
- 1.3.5. AIA G704 - Certificate of Substantial Completion; 2017.
- 1.3.6. AIA G710 - Architect's Supplemental Instructions; 2017.
- 1.3.7. AIA G714 - Construction Change Directive; 2017.

2. PART 2 PRODUCTS - NOT USED

3. PART 3 EXECUTION - NOT USED

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 00 63 25

SUBSTITUTION REQUEST FORM

Alba Architects will consider contractor requests for substitutions upon the timely receipt of this completed substitution request form, and all the required supporting documentation. Substitutions made without completion of this form, and the Architect's approval, will be solely at the contractors own risk, and will be considered defective work.

The Contractor / Sub-Contractor proposes the following substitution in accordance with the requirements of the Contract Documents:

Project:

Scope of Substitution:

Specification Reference:

Drawings Reference:

Reason(s) for Proposed Substitution:

Savings to Owner:

Impact on Project Schedule:

Impact of Guarantees and Warranties:

Coordination Required with Adjacent Materials and Related Systems:

Attach supporting documentation sufficient for the Architect to evaluate proposed substitution. A Substitution Request form submitted without adequate documentation will be returned without review.

Architects Response

The Architects response is based on information submitted by the Contractor. Changes to the contract sum and project schedule shall be processed using appropriate Change Order forms.

Approved:

Approved as Noted:

Revise and Resubmit:

Rejected:

END OF SECTION

ADVERTISEMENT FOR BIDS

Owner

Address

Separate sealed BIDS for the construction of (briefly describe
nature, scope, and major elements of the work)

will be received by _____
at the office of _____
until _____, (Local Time)_____, 20 _____, and then at
said office publicly opened and read aloud.

The CONTRACT DOCUMENTS may be examined at the following locations:

Copies of the CONTRACT DOCUMENTS may be obtained at the office of
_____ located at _____
upon payment of \$ _____ for each set.

1/2

(1-15-79) SPECIAL PN

Any BIDDER, upon returning the CONTRACT DOCUMENTS promptly and in good condition, will be refunded the payment, and any non-bidder upon so returning the CONTRACT DOCUMENTS will be refunded \$_____.

DATE

oOo

2/2



AIA® Document A701® – 2018

Instructions to Bidders

for the following Project:

(Name, location, and detailed description)

THE OWNER:

(Name, legal status, address, and other information)

THE ARCHITECT:

(Name, legal status, address, and other information)

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

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.

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.)

§ 3.1.2 Any required deposit shall be refunded to Bidders who submit a bona fide Bid and return the paper Bidding Documents in good condition within ten days after receipt of Bids. The cost to replace missing or damaged paper documents will be deducted from the deposit. A Bidder receiving a Contract award may retain the paper Bidding Documents, and the Bidder's deposit will be refunded.

§ 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.)

§ 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.

§ 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.)

§ 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.)

§ 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.

§ 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 _____ 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.)

§ 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.)

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.

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 Building Information Modeling Exhibit, if completed:

.5 Drawings

Number	Title	Date

.6 Specifications

Section	Title	Date	Pages

.7 Addenda:

Number	Date	Pages

.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.)

☐ The Sustainability Plan:

Title	Date	Pages

☐ Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages

.9 Other documents listed below:

(List here any additional documents that are intended to form part of the Proposed Contract Documents.)

ATTACHMENT TO AIA DOCUMENT A701-2018, *Instructions to Bidders*

The provisions of this Attachment shall delete, modify and supplement the provisions contained in the "*Instructions to Bidders*", AIA Document A701-2018 Edition. The provisions contained in this Attachment will supersede any conflicting provisions of the AIA Document. The term "Agency", as used in this Attachment, shall mean the United States of America, acting through the United States Department of Agriculture.

When the project is not subject to the Build America, Buy America Act the provisions in bold do not apply.

ARTICLE 1, DEFINITIONS

Add the following paragraphs and subparagraphs:

1.10 Build America, Buy America Act (BABAA) - Requirements instituted by the Bipartisan Infrastructure Law of 2021 mandating domestic preference that all iron and steel, manufactured products, and construction materials are produced in the United States.

1.10.1 Construction Materials - Those articles, materials, or supply - other than an item of primarily iron or steel; a manufactured product; cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives - that are or consist primarily of: non-ferrous metals, plastic and polymer-based products, glass, lumber or drywall.

1.10.2 Manufactured Product - Items assembled out of components, or otherwise made or processed from raw materials into finished products. Manufactured products must be manufactured (assembled) in the United States, and the cost of components that were mined, produced, or manufactured in the United States must be greater than 55 percent of the total cost of all components of the project.

1.10.3 Manufacturer's Certification - Documentation provided by a Manufacturer, certifying that the items provided by Manufacturer meet the domestic preference requirements of BABAA.

ARTICLE 2, BIDDER'S REPRESENTATIONS

Add the following clauses to paragraph 2.1:

.7 This Bid has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this Bid, with any other Bidder or with any competitor.

.8 Bidder is familiar with all laws and regulations that may affect cost, progress, and performance of the work; **including BABAA requirements.**

ARTICLE 3, BIDDING DOCUMENTS

Add the following sentence to the end of subparagraph 3.3.1: "Any request for substitute or "or equal" shall include the Manufacturer's Certification of compliance with the Build America, Buy America Act (BABAA) requirements mandated by Title IX of the Infrastructure Investment and Jobs Act ("IIJA"), Pub. L.177-58".

ARTICLE 4, BIDDING PROCEDURES

Add the following sentence to the end of subparagraph 4.1.1:

"Only one copy of the Bid is to be submitted".

Delete subparagraph 4.2.1 in its entirety and substitute the following:

4.2.1 Each Bid must be accompanied by a Bid Bond payable to the Owner for 5% of the total amount of the Bid.

Delete the last sentence of subparagraph 4.2.4 and substitute the following:

"However, if no Contract has been awarded or a Bidder has not been notified of the acceptance of its Bid, a Bidder may withdraw its Bid and request the return of its bid security beginning 60 days after the opening of Bids, unless a different period of time is mandated by State Law." Should there be reasons why the Contract cannot be awarded within the specified period, the time may be extended, by mutual agreement between the Owner and the Bidder, and the concurrence of the Agency.

Add the following subparagraphs and clauses to paragraph 4.3:

4.3.6 All applicable laws, ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the Project, shall apply to the Contract throughout.

4.3.7 Reserved

4.3.8 The Bidder agrees to abide by the requirements of section 319 of Public Law 101-121, which pertains to lobbying activities and applies to recipients of contracts or subcontracts that exceed \$100,000 at any tier under a Federal loan that exceeds \$150,000 or a Federal grant that exceeds \$100,000. Each Bid shall be accompanied by a completed lobbying certification form identical to that included in the Bidding Documents.

4.3.9 The Bidder agrees to abide by the requirements under 2 CFR Part 417, which pertains to the debarment or suspension of a person from participating in a Federal program or activity.

4.3.10 This Bid is for services related to a project that is subject to the Build America, Buy America Act (BABAA) requirements under Title IX of the Infrastructure Investment and Jobs Act ("IIJA"), Pub. L. 177-58. Absent an approved waiver, all iron, steel, manufactured products, and construction materials used in this project must be produced in the United States, as further outlined by the Office of Management and Budget's regulation (reference 2 CFR 200) on the application of Buy America Preference in Federal Financial Assistance Programs for Infrastructure.

4.3.11 Under these Bidding Instructions, all Bidders (Contractors / Subcontractors) shall be responsible for:

- .1 Providing bids that reflect compliance with BABAA requirements.
- .2 Providing only iron, steel, construction materials and manufactured products that meet BABAA requirements. Installation of materials or products that are not compliant with BABAA requirements shall be considered defective work.
- .3 Including manufacturer's certification for BABAA requirements with all applicable submittals. If a specific manufacturer is used in the bidding, a statement that the manufacturer will comply with BABAA requirements must be included with the bid submission. Contractor shall comply with BABAA requirements, including coordination with manufacturers, distributors, and suppliers to correct deficiencies in any BABAA documentation.
- .4 Providing manufacturer's certification for BABAA requirements with any change order for any new construction materials or manufactured products required by the change.
- .5 Certifying by submitting an application for payment, based in whole or in part on furnishing construction materials or manufactured products; that such materials and products, to the Contractor's, knowledge, are compliant with BABAA requirements.
- .6 Ensuring that the Architect / Engineer has been provided an approved manufacturer's certification or waiver prior to items being delivered to the project site.

**.7 Certifying upon completion that all work and
materials are in compliance with BABAA requirements.**

Add the following terms and conditions to subparagraph 4.4.3:

The Owner keep the bid security provided by the Bidder.

ARTICLE 5, CONSIDERATION OF BIDS

Delete subparagraph 5.3.2 in its entirety and substitute the following:

5.3.2 The Owner shall have the right to accept Alternates in the sequence or combinations listed and to determine the low Bidder on the basis of the sum of the Base Bid and the Alternates accepted.

ARTICLE 7, PERFORMANCE BOND AND PAYMENT BOND

Delete subparagraph 7.1.1 in its entirety and substitute the following:

7.1.1 Prior to execution of the Contract, the Bidder shall furnish Bonds covering the faithful performance of the Contract and the payment of all obligations arising thereunder. Both Bonds shall be separately written, each in the amount of the Contract Sum with Power of Attorney attached naming "The United States of America, acting through the United States Department of Agriculture, Rural Development" as co-obligee. The cost shall be included in the Bid.

Delete subparagraph 7.1.3 in its entirety and substitute the following:

7.1.3 Surety companies executing Bonds must hold a certificate of authority as a acceptable surety on Federal Bonds as listed in Treasury Circular 570, as amended, and be authorized to transact business in the State where the Project is located.

Delete subparagraph 7.2.1 in its entirety and substitute the following:

7.2.1 The Bidder to whom the Contract is awarded will be required to execute the Agreement and obtain Performance and Payment Bonds, if required, within ten (10) calendar days from the date when the Notice of Award is delivered to the Bidder. The Notice shall be accompanied by the necessary Agreement.

Delete subparagraph 7.2.2 in its entirety and substitute the following:

7.2.2 The Bonds shall be written on forms identical to those included in the Bidding Documents.

ARTICLE 8, ENUMERATION OF CONTRACT DOCUMENTS

The following documents should be referenced, if applicable; in paragraph 8.1, clause .9:

Attachment to the *Standard Form of Agreement Between Owner and Contractor* (RD Instruction 1942-A, Guide 27, Attachment 3)

Attachment to the General Conditions of the Contract for Construction (RD Instruction 1942-A, Guide 27, Attachment 4)

Special Conditions

Invitation for Bids (Form RD 1924-5)

Instructions to Bidders, AIA A701-2018

Attachment to the Instructions to Bidders (this attachment)

Bid Form

Bid Bond

Payment Bond

Performance Bond

Certification for Contracts, Grants and Loans (RD Instruction 1940-Q, Exhibit A-1)

(Note: Any additional provisions that are necessary to remain effective after execution of the Contract for Construction will be inserted here and continue in the same format.)

o0o

BID

Proposal of _____,
(BIDDER)
organized and existing under the laws of the State of _____
and doing business as _____.
(insert "a corporation", "a partnership", or "an individual" as appropriate)
To _____.
(OWNER)

In compliance with the Advertisement for Bids, BIDDER hereby proposes to
perform all WORK for the construction of _____

in strict accordance with the CONTRACT DOCUMENTS, within the time set forth
therein, and at the prices stated below.

By submission of this BID, the BIDDER certifies, and in the case of a
joint BID each party thereto certifies as to its own organization to the
following:

1. That this BID has been arrived at independently, without consultation,
communication, or agreement as to any matter relating to this BID with
any other BIDDER or with any competitor.
2. The BIDDER is familiar with all laws and regulations that may affect
cost, progress, and performance of the work.

*If the project is not subject to the Build America, Buy America Act, delete the
provisions in bold:*

3. That this BID is for services related to a project that is subject to
the Build America, Buy America Act (BABAA) requirements under Title IX
of the Infrastructure Investment and Jobs Act ("IIJA"), Pub. L. 177-
58. Absent an approved waiver, all iron, steel, manufactured products,
and construction materials used in this project must be produced in
the United States, as further outlined by the Office of Management and
Budget's regulation (reference 2 CFR 200) on the application of Buy
America Preference in Federal Financial Assistance Programs for
Infrastructure.
4. The BIDDER shall be responsible for:
 - a. Providing bids that reflect compliance with BABAA requirements.
 - b. Providing only iron, steel, construction materials and
manufactured products that meet BABAA requirements. Installation
of materials or products that are not compliant with BABAA
requirements shall be considered defective work.
 - c. Including manufacturer's certification for BABAA requirements
with all applicable submittals. If a specific manufacturer is
used in the bidding, a statement that the manufacturer will

comply with BABAA requirements must be included with the bid submission. Contractor shall comply with BABAA requirements, including coordination with manufacturers, distributors, and suppliers to correct deficiencies in any BABAA documentation.

- d. Providing manufacturer’s certification for BABAA requirements with any change order for any new construction materials or manufactured products required by the change.
- e. Certifying by submitting an application for payment, based in whole or in part on furnishing construction materials or manufactured products; that such materials and products, to the Contractor’s, knowledge, are compliant with BABAA requirements.
- f. Ensuring that the Architect / Engineer has been provided an approved manufacturer’s certification or waiver prior to items being delivered to the project site.
- g. Certifying upon completion that all work and materials are in compliance with BABAA requirements.
- h. Ensuring that any request for substitution or “or equal” shall include the Manufacturer’s Certification of compliance with the Build America, Buy America Act (BABAA) requirements mandated by Title IX of the Infrastructure Investment and Jobs Act (“IIJA”), Pub. L.177-58.

BIDDER hereby agrees to commence WORK under this contract on or before a date to be specified in the NOTICE TO PROCEED and to fully complete the PROJECT within _____ consecutive calendar days thereafter.

BIDDER further agrees to pay to the Owner as liquidated damages the sum of \$_____ for each calendar day of delay thereafter as outlined in the Agreement.

BIDDER acknowledges receipt of the following ADDENDA, dated:

BIDDER agrees to perform all the work described in the CONTRACT DOCUMENTS for the following unit prices or lump sum:

BID SCHEDULE

NOTE: BIDS shall include sales tax and all other applicable taxes and fees.

NO.	ITEM	UNIT	UNIT PRICE	AMOUNT	TOTAL PRICE

SEAL - (if BID is by a corporation)

(Guide 19 - Attachment 4)

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned, _____

_____ as Principal, and
 _____ as Surety, are hereby
 held and firmly bound unto _____ as OWNER in the
 penal sum of _____

_____ for the
 payment of which, well and truly to be made, we hereby jointly and
 severally bind ourselves, successors and assigns.

Signed, this _____ day of _____,
 19_____. The Condition of the above obligation is such that
 whereas the Principal has submitted to _____

_____ a certain BID, attached
 hereto and hereby made a part hereof to enter into a contract in
 writing, for the

NOW, THEREFORE,

- (a) If said BID shall be rejected, or
- (b) If said BID shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attachment hereto (Properly completed in accordance with said BID) and shall furnish a BOND for faithful performance of said contract, and for the payment of all persons performing labor furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said BID, then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

(1-15-79) SPECIAL PN

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its BOND shall be in no way impaired or affected by any extension of the time within which the OWNER may accept such BID; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

_____(L.S.)
Principal

Surety

By: _____

IMPORTANT - Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the project is located.

oOo

CERTIFICATION FOR CONTRACTS, GRANTS AND LOANS

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 any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant or Federal loan, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant or loan.

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 or loan, the undersigned shall complete and submit Standard Form - LLL, "Disclosure of Lobbying Activities," 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 contracts, subcontracts, and subgrants under grants and loans) 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.

(name)

(date)

(title)

oOo

NOTICE OF AWARD

TO: _____

PROJECT Description: _____

The OWNER has considered the BID submitted by you for the above described WORK in response to its Advertisement for Bids dated _____, 19____, and Information for Bidders.

You are hereby notified that your BID has been accepted for items in the amount of \$_____.

You are required by the Information for Bidders to execute the Agreement and furnish the required CONTRACTOR'S Performance BOND, Payment BOND and certificates of insurance within ten (10) calendar days from the date of this Notice to you.

If you fail to execute said Agreement and to furnish said BONDS within ten (10) days from the date of this Notice, said OWNER will be entitled to consider all your rights arising out of the OWNER's acceptance of your BID as abandoned and as a forfeiture of your BID BOND. The OWNER will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this NOTICE OF AWARD to the OWNER.

Dated this _____ day of _____, 19____.

Owner

By _____

Title _____

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged

by _____
this the _____ day of _____, 19____.
By _____
Title _____



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)

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.

The Owner and Contractor agree as follows.

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.)

- ☐ 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.)

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.)

§ 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.)

§ 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)

§ 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.)

☐ 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)

ATTACHMENT TO AIA DOCUMENT A101-2017, *Standard Form of Agreement Between Owner and Contractor*

The provisions of this Attachment shall delete, modify and supplement the provisions contained in the "*Standard Form of Agreement Between Owner and Contractor*," AIA Document A101-2017 Edition. The provisions contained in this attachment shall supersede any conflicting provisions of the AIA Document. The term "Agency", as used in this Attachment, shall mean the United States of America, acting through the United States Department of Agriculture.

When the project is not subject to the Build America, Buy America Act the provisions in bold do not apply.

ARTICLE 3, DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

Delete paragraph 3.1 and associated option boxes in their entirety and replace with the following:

3.1 The date of commencement shall be contained in the Notice to Proceed.

Replace subparagraph 3.3.3 with the following:

3.3.3 If the work is not substantially complete on or before this date, or within this period of time, or extension thereof granted by the Owner, damage will be sustained by the Owner and that it is and will be impracticable and extremely difficult to fix the actual damage which the Owner will sustain in the event of and by reason of such delays. The Contractor shall pay to the Owner liquidated damages in the sum of \$_____ for each calendar day of delay. Any sums that may be due the Owner as liquidated damages may be deducted from any monies due or to become due the Contractor under the Contract or may be collected from the Contractor's surety.

ARTICLE 5, PAYMENTS

Add the following after the words "Payment issued by the Architect" in subparagraph 5.1.1: "using AIA Document G702, 'Application and Certificate for Payment,' or Form RD 1924-18, 'Partial Payment Estimate'".

Add the following to the end of subparagraph 5.1.1: "Agency concurrence is required on all Applications of Payment before payment is made".

Insert "ten" and "10" in the appropriate spaces in the last sentence in subparagraph 5.1.3.

Insert the following retainage description and clauses in subparagraph 5.1.7.1:

The amount retained shall be 10% of the value of Work until 50% of the Work has been completed or a withholding of equal or

greater value, such as, 5% for the full duration of the project. If 10% is held, at 50% completion, further partial payments shall be made in full to the Contractor and no additional amounts may be retained unless the Architect certifies that the Work is not proceeding satisfactorily but amounts previously retained shall not be paid to the Contractor. At 50% completion or any time thereafter when the progress of the Work is not satisfactory, additional amounts may be retained, but in no event shall the total retainage be more than 10% of the value of Work completed. Alternate industry-standard retainage proposals may be considered by RD when:

.1 The retainage proposal is mandated by the State in which the project is located.

.2 The retainage proposal does not add risk to the applicant and the Agency.

ARTICLE 8, MISCELLANEOUS PROVISIONS

Add the following subparagraphs and clauses to paragraph 8.7:

8.7.1 This agreement and any amendments to this agreement shall not be in full force and effect until concurred with in writing by a duly authorized representative of the Agency. The concurrence so evidenced by the Agency shall in no way commit the Agency to render financial assistance to the Owner and is without liability to the Agency for any payment thereunder, but in the event such assistance is provided, the concurrence shall signify that the provisions of this Agreement and any amendments to this Agreement are consistent with Agency requirements.

8.7.2 Build America, Buy America Act

Domestic Preference Requirements for Federal Financial Assistance to Non-Federal Entities. Federal Financial Assistance to Non-Federal Entities, defined pursuant to 2 CFR 200.1 as any State, local government, Indian tribe, Institution of Higher Education, or nonprofit organization, shall be governed by the requirements of Section 70914 of the Build America, Buy America Act (BABAA), under Title IX of the Infrastructure Investment and Jobs Act, Pub. L. 177-58. Any requests for waiver of these requirements must be submitted pursuant to USDA's guidance available online at [USDA Buy America Waivers for Federal Financial Assistance | USDA.](#)

8.7.2.1 This agreement is for services related to a project that is subject to the Build America, Buy America Act (BABAA) requirements under Title IX of the Infrastructure Investment and Jobs Act ("IIJA"), Pub. L. 177-58. Absent an approved waiver, all iron, steel, manufactured products, and construction materials used in this project must be produced in the United States, as further outlined by the Office of Management and Budget's regulation (reference 2 CFR 200) on the application of Buy America Preference in Federal Financial Assistance Programs for Infrastructure.

8.7.2.2 The Contractor shall be responsible for:

- .1 Providing costs and revisions thereof that reflect compliance with BABAA requirements.
- .2 Providing only iron, steel, construction materials and manufactured products that meet BABAA requirements. Installation of materials or products that are not compliant with BABAA requirements shall be considered defective work.
- .3 Including manufacturer's certification for BABAA requirements with all applicable submittals. If a specific manufacturer is used in the bidding, a statement that the manufacturer will comply with BABAA requirements must be included with the bid submission. Contractor shall comply with BABAA requirements, including coordination with manufacturers, distributors, and suppliers to correct deficiencies in any BABAA documentation.
- .4 Providing manufacturer's certification for BABAA requirements with any change order for any new construction materials or manufactured products required by the change.
- .5 Certifying by submitting an application for payment, based in whole or in part on furnishing construction materials or manufactured products; that such materials and products, to the Contractor's knowledge, are compliant with BABAA requirements.
- .6 Ensuring that the Architect / Engineer has been provided an approved manufacturer's certification or waiver prior to items being delivered to the project site.
- .7 Certifying upon completion that all work and materials are in compliance with BABAA requirements.

ARTICLE 9, ENUMERATION OF CONTRACT DOCUMENTS

The following documents should be referenced, if applicable; in paragraph 9.1, clause .9:

Attachment to the *Standard Form of Agreement Between Owner and Contractor* (this Attachment)
Attachment to the General Conditions of the Contract for Construction (RD Instruction 1942-A, Guide 27, Attachment 4)
Advertisement For Bids (RD Instruction 1942-A, Guide 19, Attachment 1)
Instructions to Bidders, AIA A701-2018
Attachment to the Instructions to Bidders (RD Instruction 1942-A, Guide 27, Attachment 2)
Bid Form
Bid Bond
Payment Bond
Performance Bond
Certification for Contracts, Grants and Loans (RD Instruction 1940-Q, Exhibit A-1)
Disclosure of Lobbying Activities (Form SF-LLL)
Compliance Statement (Form RD 400-6)

PAGE 8, OWNER AND CONTRACTOR SIGNATURE PAGE

Delete the signature block and replace with the following:

IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized officials, this Agreement in duplicate on the respective dates indicated below:

OWNER:

ATTEST: _____	By _____
Type Name _____	Type Name _____
Title _____	Title _____
Date _____	Date _____

CONTRACTOR:

ATTEST: _____	By _____
Type Name _____	Type Name _____
Title _____	Title _____
Date _____	Date _____

AGENCY CONCURRENCE:

By _____

Type Name _____

Title _____

Date _____

The concurrence so evidenced by the Agency shall in no way commit the Agency to render financial assistance to the Owner and is without liability to the Agency for any payment hereunder, but in the event such assistance is provided, the concurrence shall signify the provisions of this Agreement are consistent with Agency requirements.

oOo

(Guide 19 - Attachment 6)

PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS: that

(Name of Contractor)_____
(Address of Contractor)a _____ hereinafter called PRINCIPAL and
(Corporation, Partnership or Individual)_____
(Name of Surety)

hereinafter called SURETY, are held and firmly bound unto _____

(Name of Owner)_____
(Address of Owner)

hereinafter called OWNER and the United States of America acting through Rural Development hereinafter referred to as GOVERNMENT, and unto all persons, firms, and corporations who or which may furnish labor, or who furnish materials to perform as described under the contract and to their successors and assigns in the total aggregate penal sum of _____

_____ Dollars (\$ _____)

in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the PRINCIPAL entered into a certain contract with the OWNER, dated the _____ day of _____ 19____, a copy of which is hereto attached and made a part hereof for the construction of:

NOW, THEREFORE, if the PRINCIPAL shall promptly make payment to all persons, firms, and corporations furnishing materials for or performing labor in the prosecution of the WORK provided for in such contract, and any authorized extensions or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such WORK, and for all labor cost incurred in such WORK including that by a SUBCONTRACTOR, and to any mechanic or materialman lienholder whether it acquires its lien by operation of State or Federal law; then this obligation shall be void, otherwise to remain in full force and effect.

(1-15-79) SPECIAL PN

PROVIDED, that beneficiaries or claimants hereunder shall be limited to the SUBCONTRACTORS, and persons, firms, and corporations having a direct contract with the PRINCIPAL or its SUBCONTRACTORS.

PROVIDED, FURTHER, that the said SURETY for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the WORK to be performed thereunder or the SPECIFICATIONS accompanying the same shall in any way affect its obligation on this BOND, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of this contract or to the WORK or to the SPECIFICATIONS.

PROVIDE, FURTHER, that no suit or action shall be commenced hereunder by any claimant: (a) Unless claimant, other than one having a direct contract with the PRINCIPAL (or with the GOVERNMENT in the event the GOVERNMENT is performing the obligations of the OWNER), shall have given written notice to any two of the following: The PRINCIPAL, the OWNER, or the SURETY above named within ninety (90) days after such claimant did or performed the last of the work or labor, or furnished the last of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the PRINCIPAL, OWNER, or SURETY, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the state in which the aforesaid project is located, save that such service need not be made by a public officer. (b) After the expiration of one (1) year following the date of which PRINCIPAL ceased work on said CONTRACT, is being understood, however, that if any limitation embodied in the BOND is prohibited by any law controlling the construction hereof, such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.

PROVIDED, FURTHER, that it is expressly agreed that this BOND shall be deemed amended automatically and immediately, without formal and separate amendments hereto, upon amendment to the Contract not increasing the contract price more than 20 percent, so as to bind the PRINCIPAL and the SURETY to the full and faithful performance of the Contract as so amended. The term "Amendment", wherever used in this BOND and whether referring to this BOND, the contract or the loan Documents shall include any alteration, addition, extension or modification of any character whatsoever.

PROVIDED, FURTHER, that no final settlement between the OWNER or GOVERNMENT and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

(Guide 19 - Attachment 6) (Page 3)

WITNESS WHEREOF, this instrument is executed in ____ counterparts, each of
Number
which shall be deemed an original, this the ____ day of _____.

ATTEST:

_____ (Principal) Secretary	_____ Principal
(SEAL)	By _____(s)
	_____ (Address)
_____ Witness as to Principal	_____ (Address)
_____ (Address)	_____ Surety
ATTEST:	By _____
_____ Witness as to Surety	_____ Attorney-in-Fact
_____ (Address)	_____ (Address)

NOTE: Date of BOND must not be prior to date of Contract.
If CONTRACTOR Is partnership, all partners should execute BOND.
IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the Project is located.

oOo

(1-15-79) SPECIAL PN

(Guide 19 - Attachment 5)

PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS: that

(Name of Contractor)

(Address of Contractor)

a _____, hereinafter called Principal,
and
(Corporation, Partnership, or Individual)

(Name of Surety)

(Address of Surety)
hereinafter called Surety, are held and firmly bound unto _____

(Name of Owner)

(Address of Owner)

hereinafter called OWNER, and the United States of America acting through
Rural Development hereinafter referred to as the Government in the total
aggregate penal sum of _____

_____ Dollars (\$_____)

in lawful money of the United States, for the payment of which sum well and
truly to be made, we bind ourselves, our heirs, executors, administrators,
successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered
into a certain contract with the OWNER, dated the _____ day of _____
19____, a copy of which is hereto attached and made a part hereof for the
construction of:

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term thereof, and any extensions thereof which may be granted by the OWNER, or GOVERNMENT, with or without notice to the SURETY and during the one year guaranty period and if the PRINCIPAL shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the OWNER and GOVERNMENT from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the OWNER and GOVERNMENT all outlay and expense which the OWNER and GOVERNMENT may incur in making good any default, then this obligation shall be void, otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the liability of the PRINCIPAL AND SURETY hereunder to the GOVERNMENT shall be subject to the same limitations and defenses as may be available to them against a claim hereunder by the OWNER, provided, however, that the GOVERNMENT may, at its option, perform any obligations of the OWNER required by the contract.

PROVIDED, FURTHER, that the said SURETY, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to WORK to be performed thereunder or the SPECIFICATIONS accompanying same shall in any way affect its obligation on this BOND, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the SPECIFICATIONS.

PROVIDED, FURTHER, that it is expressly agreed that the BOND shall be deemed amended automatically and immediately, without formal and separate amendments hereto, upon amendment to the Contract not increasing the contract price more than 20 percent, so as to bind the PRINCIPAL and the SURETY to the full and faithful performance of the CONTRACT as so amended. The term "Amendment", wherever used in this BOND, and whether referring to this BOND, the Contract or the Loan Documents shall include any alteration, addition, extension, or modification of any character whatsoever.

PROVIDED, FURTHER, that no final settlement between the OWNER or GOVERNMENT and the PRINCIPAL shall abridge the right of the other beneficiary hereunder, whose claim may be unsatisfied. The OWNER and GOVERNMENT are the only beneficiaries hereunder.

(Guide 19 Attachment 5) (Page 3)

IN WITNESS WHEREOF, this instrument is executed in _____ counterparts, each
Number
one of which shall be deemed an original, this the _____ day of _____
_____ .

ATTEST:

Principal

(Principal) Secretary

(SEAL)

By _____(s)

(Witness as to Principal) (Address)

(Address)

Surety

ATTEST:

Witness to Surety BY _____

Attorney-in-Fact

(Address) (Address)

NOTE: Date of BOND must not be prior to date of Contract.

If CONTRACTOR is partnership, all partners should execute BOND.
IMPORTANT: Surety companies executing BONDS must appear on the Treasury
Department's most current list (Circular 570 as amended) and be authorized to
transact business in the state where the Project is located.

oOo

(5-23-79) PN 675



AIA[®] Document A201[®] – 2017

General Conditions of the Contract for Construction

for the following PROJECT:

(Name and location or address)

Whitefield Public Library – Additions & Renovations
8 Lancaster Road
Whitefield, NH 03598
CCI Project #0023-24

THE OWNER:

(Name, legal status and address)

Town of Whitefield
Whitefield Public Library
56 Littleton Road
Whitefield, NH 03598

THE ARCHITECT:

(Name, legal status and address)

Alba Architectss LLP
PO Box 186
137 Main Street
North Woodstock, NH 03262

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.

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GENERAL PROVISIONS

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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

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

§ 1.1.2 The Contract

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

§ 1.1.3 The Work

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

§ 1.1.4 The Project

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

§ 1.1.5 The Drawings

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

§ 1.1.6 The Specifications

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

§ 1.1.7 Instruments of Service

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

§ 1.1.8 Initial Decision Maker

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

§ 1.2 Correlation and Intent of the Contract Documents

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

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

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

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

§ 1.3 Capitalization

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

§ 1.4 Interpretation

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

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

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

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

§ 1.6 Notice

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

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

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document

G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

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

§ 2.2 Evidence of the Owner's Financial Arrangements

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

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

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

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

§ 2.3 Information and Services Required of the Owner

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

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

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

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

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

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

§ 2.4 Owner's Right to Stop the Work

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

§ 2.5 Owner's Right to Carry Out the Work

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

ARTICLE 3 CONTRACTOR

§ 3.1 General

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

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

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

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

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

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

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

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

§ 3.3 Supervision and Construction Procedures

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

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

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

§ 3.4 Labor and Materials

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

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

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

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

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

§ 3.6 Taxes

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

§ 3.7 Permits, Fees, Notices and Compliance with Laws

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

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

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

§ 3.7.4 Concealed or Unknown Conditions

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

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

§ 3.8 Allowances

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

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- .1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- .2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- .3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

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

§ 3.9 Superintendent

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

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

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

§ 3.10 Contractor's Construction and Submittal Schedules

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

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

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

§ 3.11 Documents and Samples at the Site

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

delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 Shop Drawings, Product Data and Samples

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

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

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

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

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

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

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

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

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

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

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will

specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

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

§ 3.13 Use of Site

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

§ 3.14 Cutting and Patching

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

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

§ 3.15 Cleaning Up

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

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

§ 3.16 Access to Work

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

§ 3.17 Royalties, Patents and Copyrights

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

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

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

ARTICLE 4 ARCHITECT

§ 4.1 General

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

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

§ 4.2 Administration of the Contract

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

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

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

§ 4.2.4 Communications

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

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

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

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

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

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

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

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

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

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

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

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

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

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

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

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

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

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

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

§ 5.3 Subcontractual Relations

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

§ 5.4 Contingent Assignment of Subcontracts

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

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

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

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

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

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

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

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

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

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

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

§ 6.2 Mutual Responsibility

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

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

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

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

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

§ 6.3 Owner's Right to Clean Up

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

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

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

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

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

§ 7.2 Change Orders

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

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

§ 7.3 Construction Change Directives

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

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

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

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

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

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

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

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

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

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

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

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

§ 7.4 Minor Changes in the Work

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

ARTICLE 8 TIME

§ 8.1 Definitions

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

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

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

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

§ 8.2 Progress and Completion

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

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

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

§ 8.3 Delays and Extensions of Time

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

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

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

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

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

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

§ 9.2 Schedule of Values

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

§ 9.3 Applications for Payment

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

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

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

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

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

§ 9.4 Certificates for Payment

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

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

§ 9.5 Decisions to Withhold Certification

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

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;

- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or a Separate Contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- .7 repeated failure to carry out the Work in accordance with the Contract Documents.

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

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

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

§ 9.6 Progress Payments

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

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

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

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

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

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

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

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

§ 9.7 Failure of Payment

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

§ 9.8 Substantial Completion

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

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

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

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

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

§ 9.9 Partial Occupancy or Use

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

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

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

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

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

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

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

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

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

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

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

§ 10.2 Safety of Persons and Property

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

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

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

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

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

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

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

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

§ 10.2.8 Injury or Damage to Person or Property

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

§ 10.3 Hazardous Materials and Substances

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

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will

promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

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

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

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

§ 10.4 Emergencies

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

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

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

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

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

§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act

or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 Owner's Insurance

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

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

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

§ 11.3 Waivers of Subrogation

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

§11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

§ 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and

approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;
- .3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- .4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- .1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
- .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

- .1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- .1 cease operations as directed by the Owner in the notice;
- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.

§ 15.1.7 Waiver of Claims for Consequential Damages

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

- .1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- .2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 Arbitration

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 Consolidation or Joinder

§ 15.4.4.1 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.

Additions and Deletions Report for

AIA® Document A201® – 2017

This Additions and Deletions Report, as defined on page 1 of the associated document, reproduces below all text the author has added to the standard form AIA document in order to complete it, as well as any text the author may have added to or deleted from the original AIA text. Added text is shown underlined. Deleted text is indicated with a horizontal line through the original AIA text.

Note: This Additions and Deletions Report is provided for information purposes only and is not incorporated into or constitute any part of the associated AIA document. This Additions and Deletions Report and its associated document were generated simultaneously by AIA software at 09:10:46 ET on 08/05/2024.

PAGE 1

Whitefield Public Library – Additions & Renovations
8 Lancaster Road
Whitefield, NH 03598
CCI Project #0023-24

...

Town of Whitefield
Whitefield Public Library
56 Littleton Road
Whitefield, NH 03598

...

(Name, legal status and address)

Alba Architectss LLP
PO Box 186
137 Main Street
North Woodstock, NH 03262

The parties shall agree upon ~~written~~ protocols governing the transmission and use of, ~~and reliance on,~~ of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

...

Any use of, or reliance on, all or a portion of a building information model without agreement to ~~written~~ protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

Certification of Document's Authenticity

AIA® Document D401™ – 2003

I, _____, hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 09:10:46 ET on 08/05/2024 under Order No. 2114453616 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A201™ – 2017, General Conditions of the Contract for Construction, other than those additions and deletions shown in the associated Additions and Deletions Report.

(Signed)

(Title)

(Dated)

ATTACHMENT TO AIA DOCUMENT A201-2017, *General Conditions of the Contract for Construction*

The provisions of this attachment shall delete, modify and supplement the provisions contained in the "*General Conditions of the Contract for Construction*," AIA Document A201-2017 Edition. The provisions contained in this attachment will supersede any conflicting provisions of the AIA Document. The term "Agency," as used in this Attachment, shall mean the United States of America, acting through the United States Department of Agriculture.

When the project is not subject to the Build America, Buy America Act the provisions in bold do not apply.

ARTICLE 1, GENERAL PROVISIONS

Add the following subparagraphs to paragraph 1.1:

1.1.9 Build America, Buy America Act (BABAA) - Requirements instituted by the Bipartisan Infrastructure Law of 2021 mandating domestic preference that all iron and steel, manufactured products, and construction materials are produced in the United States.

1.1.9.1 Construction Materials - Those articles, materials, or supply - other than an item of primarily iron or steel; a manufactured product; cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives - that are or consist primarily of: non-ferrous metals, plastic and polymer-based products, glass, lumber or drywall.

1.1.9.2 Manufactured Product - Items assembled out of components, or otherwise made or processed from raw materials into finished products. Manufactured products must be manufactured (assembled) in the United States, and the cost of components that were mined, produced, or manufactured in the United States must be greater than 55 percent of the total cost of all components of the project.

1.1.9.3 Manufacturer's Certification - Documentation provided by a Manufacturer, certifying that the items provided by Manufacturer meet the domestic preference requirements of BABAA.

ARTICLE 2, OWNER

Delete subparagraph 2.3.6 and substitute the following:

2.3.6 The Owner shall furnish to the Contractor, free of charge, _____ copies of the Contract Documents necessary for execution of the Work. Additional copies will be available from the Architect at the cost of reproduction and handling.

ARTICLE 3: CONTRACTOR

Add the following subparagraph to paragraph 3.7:

3.7.3.1 The Contractor shall comply with the Federal Requirement for Domestic Preference: Iron and steel products, Manufactured Products, and Construction Materials used in this project shall comply with the Build America, Buy America Act (BABAA) requirements mandated by Title IX of the Infrastructure Investment and Jobs Act ("IIJA"), Pub. L. 177-58. Installation of materials or products that are not compliant with BABAA requirements shall be considered defective work.

ARTICLE 4, ARCHITECT

Add the following to subparagraph 4.1.1: The term "Architect" means the Architect, or the Engineer when the nature of the work is within the authority granted engineers by the State licensure law, or an authorized representative of the Architect or Engineer.

ARTICLE 5, SUBCONTRACTORS

Add the following to the end of subparagraph 5.2.2: "The Contractor shall not contract with any person or entity declared ineligible under Federal laws or regulations from participating in federally assisted construction projects or to whom the Owner has made reasonable objection."

ARTICLE 7, CHANGES IN THE WORK

Delete the words ", Construction Change Directive" from subparagraph 7.1.1.

Insert the words ", Agency " after the word "Owner," and delete the words "A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor" in subparagraph 7.1.2.

Delete the words "Construction Change Directive" from subparagraph 7.1.3.

Delete subparagraph 7.2.1, associated clauses, and substitute the following:

7.2.1 A Change Order is a written order to the Contractor utilizing AIA Document G701, 'Change Order', or Form RD 1924-7, 'Contract Change Order', signed by the Owner, Architect, Contractor, and the Agency representative. It is issued after the execution of the Contract, authorizing a change in the Work or an adjustment in the Contract Sum or the Contract Time. The Contract Sum and the Contract Time may be changed only by Change Order. The Contractor's signing of a Change Order indicates complete agreement therein.

Add subparagraph 7.2.2, and associated clauses as follows:

7.2.2 Methods used in determining adjustments to the Contract Sum may include any of the following:

- .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluating.
- .2 Unit prices stated in the Contract Documents or subsequently agreed upon.

Add the following sentence to the beginning of subparagraph 7.3.1: "A Construction Change Directive may be used only for a change in response to an emergency as described in paragraph 10.4".

Delete subparagraph 7.3.2 in its entirety.

Add the sentence "When the use of a Construction Change Directive is justified" where appropriate to subparagraphs 7.3.3, 7.3.6, 7.3.7, 7.3.9, and 7.3.10.

ARTICLE 8, TIME

Delete subparagraph 8.1.2 in its entirety and replace with the following:

8.1.2 The date of commencement shall be contained in the Notice to Proceed.

Add the following subparagraphs:

8.2.4 The Notice to Proceed shall be issued within twenty (20) calendar days of the execution of the Agreement by the Owner. Should there be reasons why the Notice to Proceed cannot be issued within such period, the time may be extended by mutual agreement of the Owner and Contractor, with the concurrence of the Agency. If the Notice to Proceed has not been issued within the twenty (20) calendar day period or within the period mutually agreed, the

Contractor may terminate the Agreement without further liability on the part of either party.

8.3.4 As outlined in the Agreement, the Contractor agrees to pay liquidated damages to the Owner for each calendar day of delay.

ARTICLE 9, PAYMENTS AND COMPLETION

Delete subparagraph 9.3.1.1 and substitute the following:

9.3.1.1 Work performed and materials supplied under a Change Order may be included for payment only after the Change Order has been approved by all appropriate parties and concurred with by the Agency.

Add the following sentence to the end of subparagraph 9.4.1: "All Certificates for Payment shall be prepared using AIA Document G702, 'Application and Certificate for Payment' or Form RD 1924-18, 'Partial Payment Estimate'.

Add the following subparagraph:

9.6.9 No progress payments will be made that deplete the retainage, nor place in escrow any funds that are required for retainage, nor invest the retainage for the benefit of the Contractor. Retainage will not be adjusted until after construction is substantially complete.

Replace the word "seven" with the words "fifteen (15)" in the first sentence of subparagraph 9.7.

Delete subparagraph 9.8.5, after the first sentence, and substitute the following: "When the Work has been substantially completed, except for Work which cannot be completed because of weather conditions, lack of materials or other reasons, which, in the judgment of the Owner, are valid reasons for non-completion, the Owner may make additional payments, retaining at all times an amount sufficient to cover the estimated cost of the Work still to be completed. The Owner shall provide a copy of the Certificate of Substantial Completion to the Agency".

Delete subparagraphs 9.9.1 in its entirety and replace with the following subparagraph and clauses:

9.9.1 The Contractor agrees to the use and occupancy of a portion or unit of the Project before formal acceptance by the Owner under the following conditions:

.1 A "Certificate of Substantial Completion" shall be prepared and executed as provided

in subparagraph 9.8.4, except that when, in the opinion of the Architect, the Contractor is chargeable with unwarranted delay in completing the Work or other Contract requirements, the signature of the Contractor will not be required. The Certificate of Substantial Completion shall be accompanied by a written endorsement of the Contractor's insurance carrier and surety permitting occupancy by the Owner during the remaining period of the Project Work. Occupancy and use by the Owner shall not commence until authorized by public authorities having jurisdiction over the Work.

- .2 Occupancy by the Owner shall not be construed by the Contractor as being an acceptance of that part of the Project to be occupied.
- .3 The Contractor shall not be held responsible for any damage to the occupied part of the Project resulting from the Owner's occupancy.
- .4 Occupancy by the Owner shall not be deemed to constitute a waiver of existing claims in behalf of the Owner or Contractor against each other.
- .5 If the Project consists of more than one building, and one of the buildings is to be occupied, the Owner, prior to occupancy of that building, shall secure permanent property insurance on the building to be occupied and necessary permits which may be required for use and occupancy.

Add the following sentence to the end of subparagraph 9.9.3: "Use and occupancy by the Owner prior to Project acceptance does not relieve the Contractor of responsibility to maintain all insurance and bonds required of the Contractor under the Contract Documents until the Project is completed and accepted by the Owner".

ARTICLE 11, INSURANCE AND BONDS

Add the following subparagraphs and clauses:

11.1.1.1 Insurance shall be:

- .1 Written with a limit of liability of not less than \$500,000 for all damages arising out of bodily injury, including death, at any time resulting therefrom, sustained by any one person in any one accident; and a limit of liability of not less than \$500,000 aggregate for any such damages sustained by two or more persons in any one accident. Insurance shall be written with a limit of liability of not less than \$200,000 for all property damage sustained by any one person in any one accident; and a limit of liability of not less than \$200,000 aggregate for any such damage sustained by two or more persons in any one accident, or
- .2 Written with a combined bodily injury and damage liability of not less than \$700,000 per occurrence; and with an aggregate of not less than \$700,000 per occurrence.
- .3 Insurance policies shall be written with limits of liability consistent with those insurance liability limits contained in the Contract Documents but not less than limits prescribed in 11.1.1.1.1 and 11.1.1.1.2.

Delete subparagraph 11.1.2 in its entirety and substitute the following subparagraphs:

11.1.2 The Contractor shall furnish the Owner bonds covering faithful performance of the Contract and payment of obligations arising thereunder within ten (10) calendar days after receipt of the Notice of Award. The surety company executing the bonds must hold a certificate of authority as an acceptable surety on Federal bonds as listed in Treasury Circular 570 and be authorized to transact business in the State where the Project is located. The bonds (using the forms included in the Bidding Documents) shall each be equal to the amount of the Contract Sum. The United States, acting through Rural Development, will be named as co-obligee on all surety unless prohibited by State law. The cost of these bonds shall be included in the Contract Sum.

11.1.2.1 The Contractor shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current power of attorney.

11.1.2.2 If at any time a surety on any such bond is declared bankrupt or loses its right to do business in the State in which the work is to be performed or

is removed from the list of surety companies accepted on Federal Bonds, the Contractor shall within ten (10) calendar days after notice from the Owner to do so, substitute an acceptable bond in such form and sum and signed by such other surety or sureties as may be satisfactory to the Owner. The premiums of such bond shall be paid by any Contractor. No further payment shall be deemed due nor shall be made until the new surety or sureties shall have furnished an acceptable bond to the Owner.

ARTICLE 13, MISCELLANEOUS PROVISIONS

Add the following paragraphs, subparagraphs, and clauses:

13.6 This Agreement and any amendments to this Agreement shall not be in full force and effect until concurred with in writing by a duly authorized representative of the Agency. The concurrence so evidenced by the Agency shall in no way commit the Agency to render financial assistance to the Owner and is without liability to the Agency for any payment thereunder, but in the event such assistance is provided, the concurrence shall signify that the provisions of this Agreement and any amendments to this Agreement are consistent with Agency requirements.

13.7 Lands and Rights-of Way

13.7.1 Prior to the start of construction, the Owner shall obtain all lands and rights-of-way necessary for the execution and completion of work to be performed under this contract.

13.8 Reserved.

13.9 Statutes

13.9.1 The Contractor and each Subcontractor shall comply with the following statutes (and with regulations issued pursuant thereto, which are incorporated herein by reference):

13.9.1.1 Copeland Anti-Kickback Act (18 U.S.C. 874) as supplemented in Department of Labor regulations (29 CFR part 3). This Act provides that each Contractor shall be prohibited from inducing, by any means, any person in connection with construction to give up any part of the compensation to which the person is otherwise entitled.

13.9.1.2 Clean Air Act (42 U.S.C. 7414), section 114, and Water Pollution Control Act

(33 U.S.C. 1813), section 308. Under Executive Order 11738 and Environmental Protection Agency (EPA) regulations 40 C.F.R. part 15, all Contracts in excess of \$100,000 are required to comply with these Acts. The Acts require the Contractor to:

- .1 Notify the Owner of the receipt of any communication from EPA indicating that a facility to be utilized in the performance of the Contract is under consideration to be listed on the EPA list of Violating Facilities.
- .2 Certify that any facility to be utilized in the performance of any nonexempt Contractor or Subcontractor is not listed on the EPA list of Violating Facilities as of the date of the Contract Award.
- .3 Include or cause to be included the above criteria and requirements of paragraphs .1 and .2 in every nonexempt subcontract, and that the Contractor will take such action as the Government may direct as a means of enforcing such provisions.

13.9.1.3 Restrictions on Lobbying (Public Law 101-121, section 319) as supplemented in Department of Agriculture regulations (2 CFR part 418). This statute applies to the recipients of contracts or subcontracts that exceed \$100,000 at any tier under a Federal loan that exceeds \$150,000 or a Federal grant that exceeds \$100,000. If applicable, the Contractor must complete a certification form on lobbying activities related to the specific Federal loan or grant that is a funding source for this contract. The certification and disclosure forms shall be provided by the Owner.

13.10 Records

13.10.1 If the Contract is based on a negotiated Bid, the Owner, the Agency, the Comptroller General of the

United States, or any of their duly authorized representatives, shall have access to any books, documents, papers, and records of the Contractor which are pertinent to a specific Federal loan program for the purpose of making audit, examination, excerpts, and transcriptions. The Contractor shall maintain records for at least three years after the Owner makes final payment and all other pending matters are closed.

13.11 Environmental Requirements

13.11.1 Mitigation Measures - The contractor shall comply with applicable mitigation measures established in the environmental assessment for the project. These may be obtained from the Agency representative.

13.11.2 The Contractor, when constructing a Project involving trenching, excavating, or other earth moving activity, shall comply with the following environmental constraints:

13.11.2.1 Endangered Species, Historic Preservation, Human Remains and Cultural Items, Hazardous Materials, and Paleontology - Any excavation or other earth moving activity by the Contractor that provides evidence of the presence of endangered or threatened species or their critical habitat, uncovers a historical or archaeological artifact, human remains or cultural items, hazardous materials, a fossil or other paleontological materials will require the Contractor to:

- .1 Temporarily stop work;
- .2 Provide immediate notice to the Architect and the Agency, and in the case of potentially hazardous materials, provide immediate notice to local first responders and take such measures as necessary to protect the public and workers;
- .3 Take reasonable measures as necessary to protect the discovered materials or protected resource;
- .4 Abide by such direction as provided by the Agency, or

Agencies responsible for
resource protection or hazardous
materials management; and

.5 Resume work only upon notice
from the Architect and the
Agency.

13.11.2.2 Historic Preservation - Applicants
shall ensure that Contractors maintain a copy
of the following inadvertent discovery plan
onsite for review:

.1 If during the course of any
ground disturbance related to
any Project, any post review
discovery, including but not
limited to, any artifacts,
foundations, or other
indications of past human
occupation of the area are
uncovered, shall be protected by
complying with 36 CFR §
800.13(b) (3) and (c) and shall
include the following:

.2 All Work, including
vehicular traffic, shall
immediately stop within a 50 ft.
radius around the area of
discovery. The Contractor shall
ensure barriers are established
to protect the area of discovery
and notify the Architect or
Engineer to contact the
appropriate RD personnel. The
Architect or Engineer shall
engage a Secretary of the
Interior (SOI) qualified
professional archeologist to
quickly assess the nature and
scope of the discovery;
implement interim measures to
protect the discovery from
looting and vandalism; and
establish broader barriers if
further historic and/or
precontact properties, can
reasonably be expected to occur.

.3 The RD personnel shall
notify the appropriate RD
environmental staff member, the
Federal Preservation Officer

(FPO), and State Historic Preservation Office (SHPO) immediately. Indian tribe(s) or Native Hawaiian Organization (NHOs) that have an interest in the area of discovery shall be contacted immediately. The SHPO may require additional tribes or NHOs who may have an interest in the area of discovery also be contacted. The notification shall include an assessment of the discovery provided by the SOI qualified professional archeologist.

.4 When the discovery contains burial sites or human remains, the Contractor shall immediately notify the appropriate RD personnel who will contact the RD environmental staff member, FPO, and the SHPO. The relevant law enforcement authorities shall be immediately contacted by onsite personnel to reduce delay times, in accordance with tribal, state, or local laws including 36 CFR Part 800.13; 43 CFR Part 10, Subpart B; and the Advisory Council on Historic Preservation's Policy Statement Regarding treatment of Burial Sites, Human Remains, or Funerary Objects (February 23, 2007).

.5 When the discovery contains burial sites or human remains, all construction activities, including vehicular traffic shall stop within a 100 ft. radius of the discovery and barriers shall be established. The evaluation of human remains shall be conducted at the site of discovery by a SOI qualified professional. Remains that have been removed from their primary context and where that context may be in question may be retained in a secure location, pending further decisions on

treatment and disposition. RD may expand this radius based on the SOI professional's assessment of the discovery and establish broader barriers if further subsurface burial sites, or human remains can reasonably be expected to occur. RD, in consultation with the SHPO and interested tribes or NHOs, shall develop a plan for the treatment of native human remains.

.6 Work may continue in other areas of the undertaking where no historic properties, burial sites, or human remains are present. If the inadvertent discovery appears to be a consequence of illegal activity such as looting, the onsite personnel shall contact the appropriate legal authorities immediately if the landowner has not already done so.

.7 Work may not resume in the area of the discovery until a notice to proceed has been issued by RD. RD shall not issue the notice to proceed until it has determined that the appropriate local protocols and consulting parties have been consulted.

.8 Inadvertent discoveries on federal and tribal land shall follow the processes required by the federal or tribal entity.

13.11.3 Lead-Based Paint - The Contractor and Owner shall comply with applicable Agency requirements of the Lead-Based Paint Poisoning Prevention Act, as amended (42 U.S.C. 4821), and the Residential Lead-Based Paint Hazard Reduction Act of 1992 (42 U.S.C. 4851) for rehabilitation work on child occupied facilities and residential property built prior to 1978.

13.12 Debarment and Suspension

13.12.1 The Contractor shall comply with the requirements of 2 CFR part 417, which pertains to the debarment or suspension of a person from participating in a Federal program or activity.

13.13 Build America, Buy America Act

Domestic Preference Requirements for Federal Financial Assistance to Non-Federal Entities. Federal Financial Assistance to Non-Federal Entities, defined pursuant to 2 CFR 200.1 as any State, local government, Indian tribe, Institution of Higher Education, or nonprofit organization, shall be governed by the requirements of Section 70914 of the Build America, Buy America Act (BABAA), under Title IX of the Infrastructure Investment and Jobs Act, Pub. L. 177-58. Any requests for waiver of these requirements must be submitted pursuant to USDA's guidance available online at [USDA Buy America Waivers for Federal Financial Assistance | USDA.](#)

13.13.1 This agreement is for services related to a project that is subject to the Build America, Buy America Act (BABAA) requirements under Title IX of the Infrastructure Investment and Jobs Act ("IIJA"), Pub. L. 177-58. Absent an approved waiver, all iron, steel, manufactured products, and construction materials used in this project must be produced in the United States, as further outlined by the Office of Management and Budget's regulation (reference 2 CFR 200) on the application of Buy America Preference in Federal Financial Assistance Programs for Infrastructure.

13.13.2 The Contractor or Construction Manager shall be responsible for:

- .1 Providing costs and revisions thereof that reflect compliance with BABAA requirements.
- .2 Providing only iron, steel, construction materials and manufactured products that meet BABAA requirements. Installation of materials or products that are not compliant with BABAA requirements shall be considered defective work.
- .3 Including manufacturer's certification for BABAA requirements with all applicable submittals. If a specific manufacturer is used in the bidding or subcontractor pricing, a statement that the manufacturer will comply with BABAA requirements must be included with the bid or GMP submission. Contractor or

Construction Manager shall comply with BABAA requirements, including coordination with manufacturers, distributors, and suppliers to correct deficiencies in any BABAA documentation.

- .4 Providing manufacturer's certification for BABAA requirements with any change order for any new construction materials or manufactured products required by the change.
- .5 Certifying by submitting an application for payment, based in whole or in part on furnishing construction materials or manufactured products; that such materials and products, to the Contractor's or Construction Manager's knowledge, are compliant with BABAA requirements.
- .6 Ensuring that the Architect / Engineer has been provided an approved manufacturer's certification or waiver prior to items being delivered to the project site.
- .7 Certifying upon completion that all work and materials are in compliance with BABAA requirements.

ARTICLE 15 CLAIMS AND DISPUTES

Add the words "may be" after "on the parties but" in the last sentence of subparagraph 15.2.5.

Replace the word "shall" with the word "may" in the first sentence, first occurrence of subparagraph 15.3.2.

Add the subparagraph: 15.4.1.2 The arbitrators will select a hearing location as close to the Owner's current place of business as possible.

oOo

NOTICE TO PROCEED

TO: _____ DATE: _____

Project: _____

You are hereby notified to commence WORK in accordance with the Agreement dated _____, 19__, on or before _____, 19__, and you are to complete the WORK within _____ consecutive calendar days thereafter. The date of completion of all WORK is therefore _____, 19__.

Owner

By _____

Title _____

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO PROCEED is hereby acknowledged by _____

_____,
this the _____, 19__

By _____

Title _____

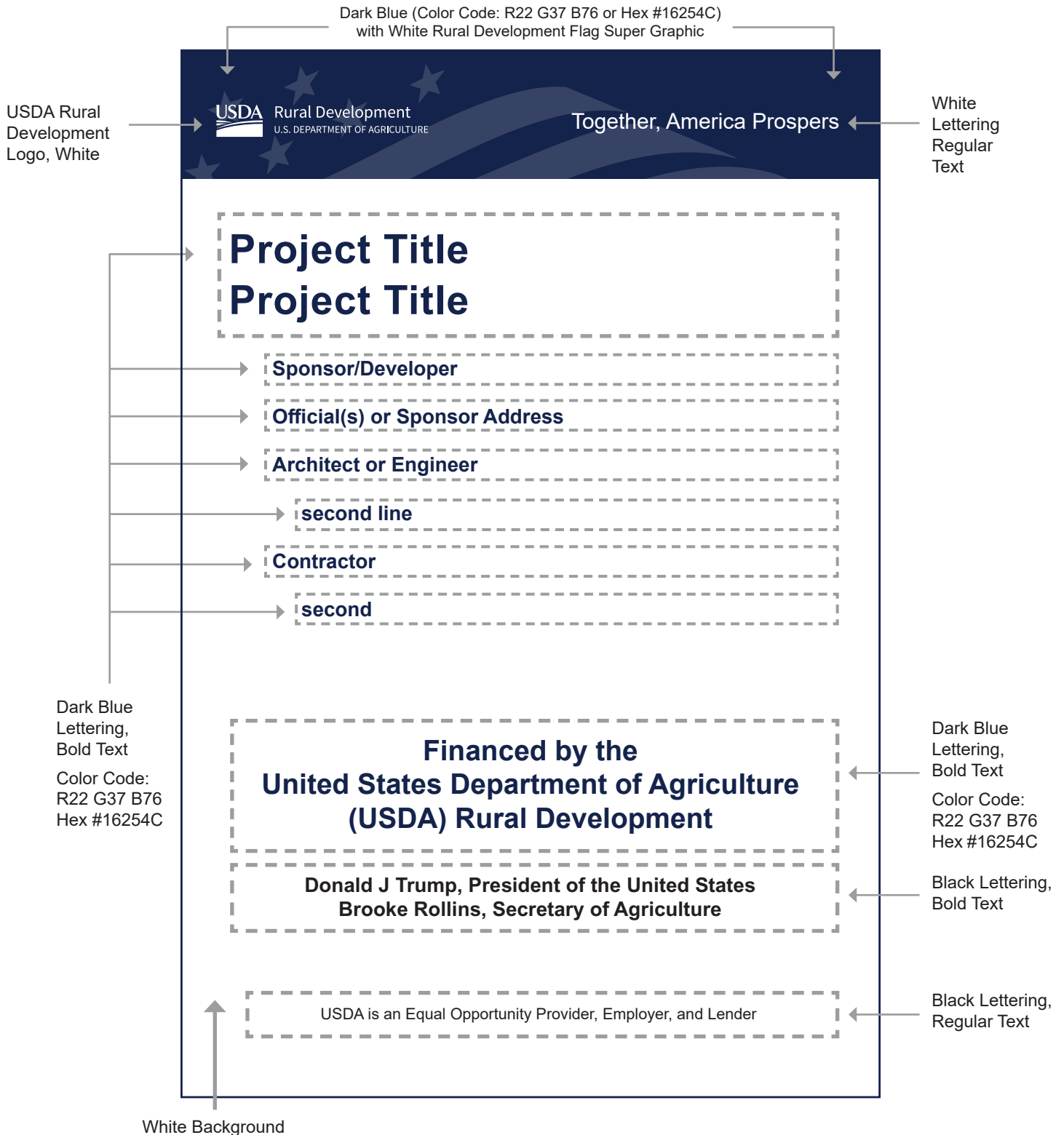
Employer Identification
Number _____

oOo

(1-28-81) PN 763

Temporary Construction Sign for Rural Development Projects

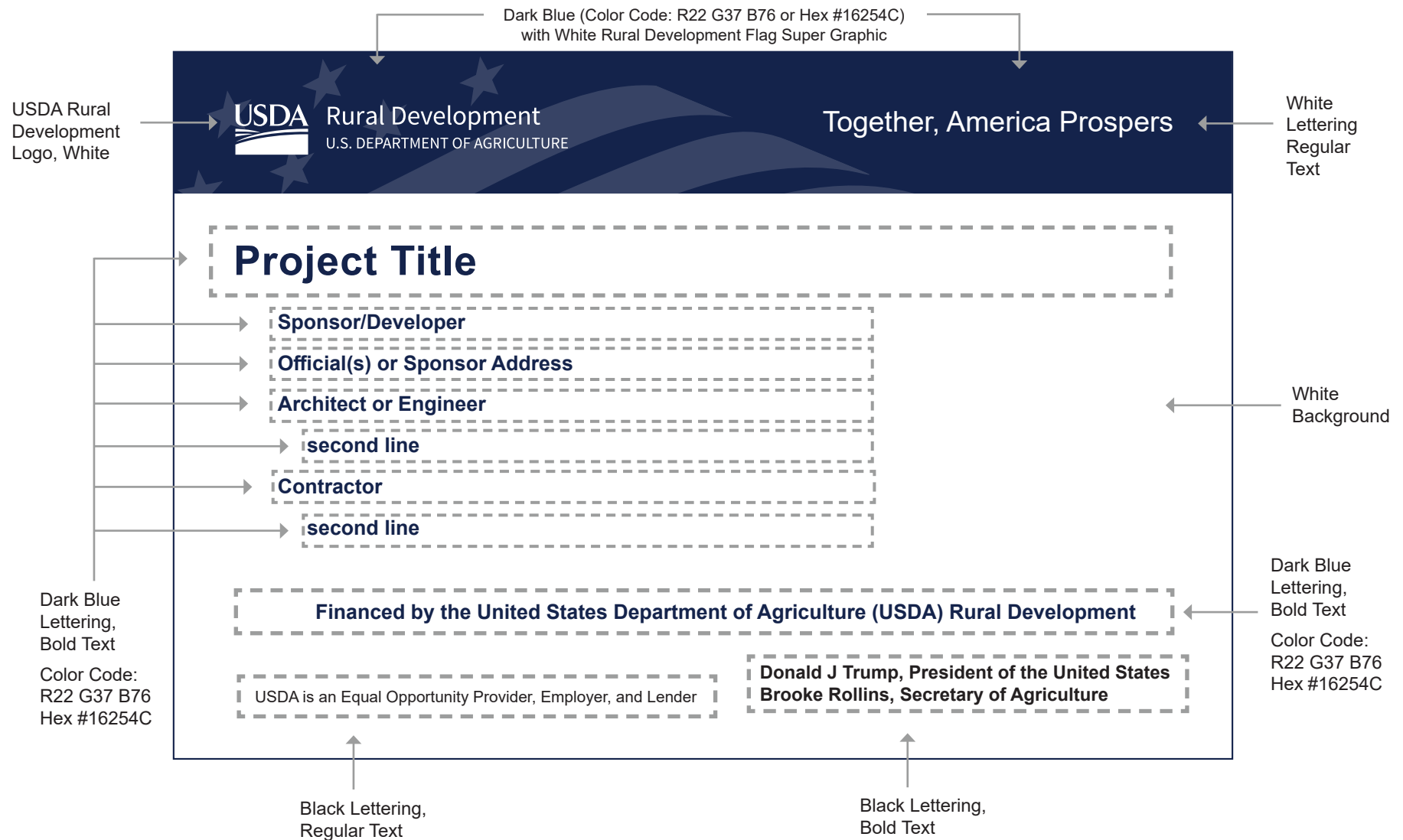
Recommended Font: Arial



SIGN DIMENSIONS: 2400mm x 1200mm x 19mm (approx. 8' x 4' x 3/4")
PLYWOOD PANEL (APA RATED A+B GRADE-EXTERIOR)

Temporary Construction Sign for Rural Development Projects

Recommended Font: Arial



SIGN DIMENSIONS: 1200mm x 2400mm x 19mm (approx. 4' x 8' x 3/4")
PLYWOOD PANEL (APA RATED A+B GRADE-EXTERIOR)

Application and Certificate for Payment

TO OWNER:	PROJECT:	APPLICATION NO:	<u>Distribution to:</u>
		PERIOD TO:	OWNER ☐
		CONTRACT FOR:	ARCHITECT ☐
FROM CONTRACTOR:	VIA ARCHITECT:	CONTRACT DATE:	CONTRACTOR ☐
		PROJECT NOS: / /	FIELD ☐
			OTHER ☐

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract. AIA Document G703®, Continuation Sheet, is attached.

1. ORIGINAL CONTRACT SUM	\$ _____
2. NET CHANGE BY CHANGE ORDERS	\$ _____
3. CONTRACT SUM TO DATE (Line 1 ± 2)	\$ _____
4. TOTAL COMPLETED & STORED TO DATE (Column G on G703)	\$ _____
5. RETAINAGE:	
a. _____% of Completed Work (Columns D + E on G703)	\$ _____
b. _____% of Stored Material (Column F on G703)	\$ _____
Total Retainage (Lines 5a + 5b, or Total in Column I of G703)..... \$ _____	
6. TOTAL EARNED LESS RETAINAGE	\$ _____ (Line 4 minus Line 5 Total)
7. LESS PREVIOUS CERTIFICATES FOR PAYMENT	\$ _____ (Line 6 from prior Certificate)
8. CURRENT PAYMENT DUE	\$ _____
9. BALANCE TO FINISH, INCLUDING RETAINAGE (Line 3 minus Line 6)	\$ _____

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner	\$ _____	\$ _____
Total approved this month	\$ _____	\$ _____
TOTAL	\$ _____	\$ _____
NET CHANGES by Change Order	\$ _____	

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR:

By: _____ Date: _____

State of: _____

County of: _____

Subscribed and sworn to before
me this _____ day of _____

Notary Public:

My commission expires: _____

ARCHITECT'S CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising this application, the Architect certifies to the Owner that to the best of the Architect's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED \$ _____

(Attach explanation if amount certified differs from the amount applied. Initial all figures on this Application and on the Continuation Sheet that are changed to conform with the amount certified.)

ARCHITECT:

By: _____ Date: _____

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.



Continuation Sheet

AIA Document G702®, Application and Certificate for Payment, or G732™, Application and Certificate for Payment, Construction Manager as Adviser Edition, containing Contractor's signed certification is attached. Use Column I on Contracts where variable retainage for line items may apply.

APPLICATION NO:

APPLICATION DATE: _____

PERIOD TO:

ARCHITECT'S PROJECT NO:

[illegible]

Form RD 1924-18
(Rev. 6-97)UNITED STATES DEPARTMENT OF AGRICULTURE
RURAL DEVELOPMENT
FARM SERVICE AGENCY**PARTIAL PAYMENT ESTIMATE**

CONTRACT NO. _____

PARTIAL PAYMENT ESTIMATE NO. _____

PAGE _____

OWNER: _____

CONTRACTOR: _____

PERIOD OF ESTIMATE

FROM _____ TO _____

CONTRACT CHANGE ORDER SUMMARY

ESTIMATE

No.	Agency Approval Date	Amount		
		Additions	Deductions	
				1. Original Contract
				2. Change Orders \$0.00
				3. Revised Contract (1 + 2) \$0.00
				4. Work Completed*
				5. Stored Materials*
				6. Subtotal (4 + 5) \$0.00
				7. Retainage*
				8. Previous Payments
				9. Amount Due (6-7-8) \$0.00
TOTALS		\$0.00	\$0.00	* Detailed breakdown attached
NET CHANGE		\$0.00	\$0.00	

CONTRACT TIME

Original (days) _____
Revised _____
Remaining _____

On Schedule

☐ Yes☐ No

Starting Date _____

Projected Completion _____

CONTRACTOR'S CERTIFICATION:

The undersigned Contractor certifies that to the best of their knowledge, information and belief the work covered by this payment estimate has been completed in accordance with the contract documents, that all amounts have been paid by the contractor for work for which previous payment estimates was issued and payments received from the owner, and that current payment shown herein is now due.

Contractor _____

By _____

Date _____

APPROVED BY OWNER:

Owner _____

By _____

Date _____

ARCHITECT OR ENGINEER'S CERTIFICATION:

The undersigned certifies that the work has been carefully inspected and to the best of their knowledge and belief, the quantities shown in this estimate are correct and the work has been performed in accordance with the contract documents.

Architect or Engineer _____

By _____

Date _____

ACCEPTED BY AGENCY:

The review and acceptance of this estimate does not attest to the correctness of the quantities shown or that the work has been performed in accordance with the contract documents.

By _____

Title _____

Date _____

TYPICAL UNIT PRICE BREAKDOWN

ITEM	DESCRIPTION	CONTRACT <i>(revised)</i>			THIS PERIOD		TOTAL TO DATE		% COM- PLETE
		QUANTITY	UNIT PRICE	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT	
				\$0.00		\$0.00		\$0.00	0
				\$0.00		\$0.00		\$0.00	0
				\$0.00		\$0.00		\$0.00	0
				\$0.00		\$0.00		\$0.00	0
				\$0.00		\$0.00		\$0.00	0
				\$0.00		\$0.00		\$0.00	0
				\$0.00		\$0.00		\$0.00	0
				\$0.00		\$0.00		\$0.00	0
				\$0.00		\$0.00		\$0.00	0
				\$0.00		\$0.00		\$0.00	0
				\$0.00		\$0.00		\$0.00	0
	TOTALS			\$0.00		\$0.00		\$0.00	0
TYPICAL LUMP SUM PRICE BREAKDOWN *						TYPICAL STORED MATERIALS AND RETAINAGE BREAKDOWN *			
ITEM	DESCRIPTION	SCHEDULED VALUE	WORK COMPLETED		% COM- PLETE	MATERIALS STORED AT END OF THIS PAYMENT PERIOD			
			THIS PERIOD	TO DATE		DESCRIPTION	QUANTITY	UNIT VALUE	AMOUNT
					0				\$0.00
					0				\$0.00
					0				\$0.00
					0				\$0.00
					0	RETAINAGE			
					0		THIS ESTIMATE	PERCENT	RETAINED
					0	WORK COMPLETED:		%	
					0	STORED MATERIALS:			
					0	OTHER (explain)			
	TOTALS	\$0.00	\$0.00	\$0.00	0	TOTAL			\$0.00

* As a minimum, detailed breakdowns should contain this information.



AIA® Document G701® – 2017

Change Order

PROJECT: *(name and address)*

CONTRACT INFORMATION:

Contract For:

Date:

CHANGE ORDER INFORMATION:

Change Order Number:

Date:

OWNER: *(name and address)*

ARCHITECT: *(name and address)*

CONTRACTOR: *(name and address)*

THE CONTRACT IS CHANGED AS FOLLOWS:

(Insert a detailed description of the change and, if applicable, attach or reference specific exhibits. Also include agreed upon adjustments attributable to executed Construction Change Directives.)

The original (Contract Sum) (Guaranteed Maximum Price) was

\$ _____

The net change by previously authorized Change Orders

\$ _____

The (Contract Sum) (Guaranteed Maximum Price) prior to this Change Order was

\$ _____

The (Contract Sum) (Guaranteed Maximum Price) will be (increased) (decreased) (unchanged) by this Change Order in the amount of

\$ _____

The new (Contract Sum) (Guaranteed Maximum Price), including this Change Order, will be

\$ _____

The Contract Time will be (increased) (decreased) (unchanged) by

() days.

The new date of Substantial Completion will be

NOTE: This Change Order does not include adjustments to the Contract Sum or Guaranteed Maximum Price, or the Contract Time, that have been authorized by Construction Change Directive until the cost and time have been agreed upon by both the Owner and Contractor, in which case a Change Order is executed to supersede the Construction Change Directive.

NOT VALID UNTIL SIGNED BY THE ARCHITECT, CONTRACTOR AND OWNER.

ARCHITECT *(Firm name)*

CONTRACTOR *(Firm name)*

OWNER *(Firm name)*

SIGNATURE

SIGNATURE

SIGNATURE

PRINTED NAME AND TITLE

PRINTED NAME AND TITLE

PRINTED NAME AND TITLE

DATE

DATE

DATE

Form RD 1924-7

(Rev. 2-97)

UNITED STATES DEPARTMENT OF AGRICULTURE
RURAL DEVELOPMENT AND
FARM SERVICE AGENCY

CONTRACT CHANGE ORDER

ORDER NO.

DATE

STATE

COUNTY

CONTRACT FOR

OWNER

To

(Contractor)

You are hereby requested to comply with the following changes from the contract plans and specifications:

Description of Changes (Supplemental Plans and Specifications Attached)	DECREASE in Contract Price	INCREASE in Contract Price
0	\$	\$
		0
		0
		0
		0
TOTALS	\$ 0.00	0.00
NET CHANGE IN CONTRACT PRICE	\$ 0.00	0.00

JUSTIFICATION:

The amount of the Contract will be (Decreased) (Increased) By The Sum Of: _____

Dollars (\$ _____).

The Contract Total Including this and previous Change Orders Will Be: _____

Dollars (\$ _____).

The Contract Period Provided for Completion Will Be (Increased) (Decreased) (Unchanged) : _____ Days.

This document will become a supplement to the contract and all provisions will apply hereto.

Requested _____
(Owner)

(Date)

Recommended _____
(Owner's Architect/Engineer)

(Date)

Accepted _____
(Contractor)

(Date)

Accepted by Agency _____
(Name and Title)

(Date)

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0575-01042. The time required to complete this information collection is estimated to average 15 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

- ☐ ORIGINAL-BORROWER'S CASE FOLDER
☐ COPY-CONTRACTOR
☐ COPY-BORROWER

POSITION 6



AIA® Document G704® – 2017

Certificate of Substantial Completion

PROJECT: *(name and address)*

CONTRACT INFORMATION:

Contract For:

Date:

CERTIFICATE INFORMATION:

Certificate Number:

Date:

OWNER: *(name and address)*

ARCHITECT: *(name and address)*

CONTRACTOR: *(name and address)*

The Work identified below has been reviewed and found, to the Architect's best knowledge, information, and belief, to be substantially complete. Substantial Completion is the stage in the progress of the Work when the Work or designated portion is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use. The date of Substantial Completion of the Project or portion designated below is the date established by this Certificate.

(Identify the Work, or portion thereof, that is substantially complete.)

ARCHITECT *(Firm Name)*

SIGNATURE

PRINTED NAME AND TITLE

DATE OF SUBSTANTIAL COMPLETION

WARRANTIES

The date of Substantial Completion of the Project or portion designated above is also the date of commencement of applicable warranties required by the Contract Documents, except as stated below:

(Identify warranties that do not commence on the date of Substantial Completion, if any, and indicate their date of commencement.)

WORK TO BE COMPLETED OR CORRECTED

A list of items to be completed or corrected is attached hereto, or transmitted as agreed upon by the parties, and identified as follows:

(Identify the list of Work to be completed or corrected.)

The failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. Unless otherwise agreed to in writing, the date of commencement of warranties for items on the attached list will be the date of issuance of the final Certificate of Payment or the date of final payment, whichever occurs first. The Contractor will complete or correct the Work on the list of items attached hereto within () days from the above date of Substantial Completion.

Cost estimate of Work to be completed or corrected: \$

The responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work, insurance, and other items identified below shall be as follows:

(Note: Owner's and Contractor's legal and insurance counsel should review insurance requirements and coverage.)

The Owner and Contractor hereby accept the responsibilities assigned to them in this Certificate of Substantial Completion:

CONTRACTOR *(Firm Name)*

SIGNATURE

PRINTED NAME AND TITLE

DATE

OWNER *(Firm Name)*

SIGNATURE

PRINTED NAME AND TITLE

DATE

SAMPLE LANGUAGE FOR CONTRACTOR'S
CERTIFICATION OF COMPLIANCE

Notes to User: The following is sample language the Contractor can use to certify compliance with the Build America Buy America Act requirements and can be modified if needed. A certification is to be provided by Contractor to Architect of Record for delivery to the Owner and Agency at Substantial Completion. The certification should be on letterhead and should be signed and dated by an authorized company representative.

Project Name
Owner / Applicant
Contract Number

I hereby certify, that to the best of my knowledge and belief, all Iron and Steel products, Manufactured Products, and Construction Materials installed for this project by my company and by any and all subcontractors and Manufacturers my company has contracted with for this project comply with the Build America, Buy America Act (BABAA) requirements under Title IX of the Infrastructure Investment and Jobs Act (IIJA), Pub. L. 117-58, §§ 70901-70953 or are the subject of a waiver approved by the Secretary of Agriculture or designee.

SAMPLE LANGUAGE FOR MANUFACTURER'S CERTIFICATION OF COMPLIANCE

Notes to User: The following is sample language for the Manufacturer's Certification of Compliance with Domestic Preference requirements. Contractor should ensure that Architect of Record has an approved Manufacturers' Certification prior to any domestic preference item being delivered to the project site. The Manufacturer's Certification should be on letterhead and should indicate the project, specific item being certified, reference which domestic preference requirement is being certified and be signed by an authorized company representative. The Manufacturer's Certification may include multiple domestic preference requirements. It is important for the governing domestic preference requirement (whether AIS, BABAA or other) to be clearly included within the certification.

Date:

Company Name:

Company Address:

Subject: Domestic Preference Requirement Certification for {Owner's Name and Project Name (City, State)} Certification for Project (X), Owner's Name, and Contract Number

Sample text:

I hereby certify that the following product(s) and / or material(s) shipped or provided for the subject project are in full compliance with the Build America, Buy America Act (BABAA) requirements under Title IX of the Infrastructure Investment and Jobs Act (IIJA), Pub. L. 117-58, §§ 70901-70953.

[List common name of items, products and/or materials]



AIA[®] Document G707[™] – 1994

Consent of Surety to Final Payment

PROJECT: *(Name and address)*

ARCHITECT'S PROJECT NUMBER:

OWNER ☐

CONTRACT FOR:

ARCHITECT ☐

CONTRACTOR ☐

TO OWNER: *(Name and address)*

CONTRACT DATED:

SURETY ☐

OTHER ☐

In accordance with the provisions of the Contract between the Owner and the Contractor as indicated above, the
(Insert name and address of Surety)

on bond of
(Insert name and address of Contractor)

, SURETY,

hereby approves of the final payment to the Contractor, and agrees that final payment to the Contractor shall not relieve
the Surety of any of its obligations to
(Insert name and address of Owner)

, CONTRACTOR,

as set forth in said Surety's bond.

, OWNER,

IN WITNESS WHEREOF, the Surety has hereunto set its hand on this date:
(Insert in writing the month followed by the numeric date and year.)

(Surety)

(Signature of authorized representative)

Attest:
(Seal)

(Printed name and title)

CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.

Date _____

Dear Sir:

I hereby acknowledge the receipt of _____ dollars
(\$ _____) in full payment of my contract dated _____ for improvement work which I did for you and
which is described in my contract.

I certify that I have paid in full for all materials purchased and all labor employed in the performance of this contract, and that there
are no claims against me under this contract on account of injuries sustained by workers employed by me or by subcontractors
thereunder. I hereby release you from any claims arising by virtue of this contract.

I am attaching Form RD 1924-10, "Release by Claimants," signed by all persons from whom I have purchased materials and by all
subcontractors and all persons employed in connection with my contract with the above-named borrower.

WARNING

**The statements and representations made above are made in connection with construction financed in whole or
in part by the United States Department of Agriculture (USDA). The statements and representations will be
used to determine the release of USDA provided funds. The making of any false statement or misrepresentation
herein may be a crime punishable under Title 18 U.S.C. § 1001 which provides in part: "Whoever, in any matter
within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals or
covers up by any trick, scheme, or device a material fact, or makes any false, fictitious or fraudulent statements or
representations, or makes or uses any false writing or statement or entry, shall be fined under [title 18 of the United
States code] or imprisoned not more than five years, or both.**

Sincerely,

Contractor

Position 6

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0575-0042. The time required to complete this information collection is estimated to average 15 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The undersigned, having received payment in full for all labor, materials, supplies, or equipment supplied to _____, Contractor, or to any subcontractor, in the construction or repair of the improvements upon the property located at:

_____, and furnished in the execution and fulfillment of contract between said Contractor and
Owner, dated

_____, do (does) hereby release and waive any and all claims, liens, and lien rights, of any kind, nature, or description whatsoever, against said property and the Owner thereof, and against said Contractor.

<i>Lien or Claimant</i>	<i>Work or Materials</i>	<i>Amount</i>	<i>Date</i>
			0
			0
			0
0			
	0	0	

RD 1924-10 (Rev. 1-98)

BUILDER'S WARRANTY

Names and Address of Purchasers or Owners

Property

For good and valuable consideration, the undersigned Warrantor hereby warrants to the Purchasers or Owners identified above and to the successors or transferees, all of whom are hereinafter referred to as Owners that:

The building, including appurtenances located on the property identified above, is constructed or improved in substantial conformity with the drawings and specifications which have been accepted in writing by the respective USDA Agency. This warranty applies to all workmanship, materials, and the installation of equipment (including, but not limited to, the heating system, water heater, ranges and refrigerator).

The Owners shall give written notice to the Warrantor promptly after the discovery of any defective condition. Such written notice must be given to the Warrantor during the period of warranty. The period of warranty shall be (a) in the case of new construction or rehabilitation, one year from the date of initial occupancy of the completed or rehabilitated building, or (b) in the case of improvements made to an existing building owned by the Owners prior to the improvements being made, one year from the date of the completion of the work.

It is agreed and understood that this warranty shall apply only to those defective conditions of which the Warrantor has been given written notice during the period of warranty.

Warrantor further agrees that warrantor will take any necessary actions to correct such defective conditions within _____ days of receipt of written notice. If such action is not taken within _____ days, the Owners may, at their option, contract with another party for the correction of the defects. Warrantor agrees to pay any expenses incurred by the Owners to correct defects covered by this warranty.

This warranty shall be in addition to, and in no way reduce, all other rights and privileges which such Owners may have under any other law or instrument, and shall be binding on the Warrantor notwithstanding any provision to the contrary contained in the contract of purchase or any other instrument executed by the Owners.

This warranty is executed, in part, for the purpose of inducing the United States Department of Agriculture, (USDA) to make, insure, or guarantee a loan on the Property.

If this warranty is signed by anyone other than the Warrantor, the person signing for the Warrantor represents and certifies that the person is authorized to execute same by the Warrantor and by the person's signature the Warrantor is bound under the terms and conditions of this warranty

- NOTES: A. The warrantor must complete all three copies except dates, meet with owner to agree on notification period, sign and give to the Owner with the final request for payment.
Owner must meet with Warrantor to agree on warranty notification period and to date and sign the warranty, owner must retain original, and forward one copy to contractor, and one to the respective USDA Agency with the final request for payment.
- B. This warranty shall be required in all cases involving new construction or rehabilitation of buildings including those built under contract, those built for sale without the respective USDA Agency's required construction inspections and those under conditional commitment procedures.

WARNING

Section 1001 of Title 18, United States Code provides: "Whoever, in any matter within the jurisdiction of any department or agency of the United States knowingly and willfully . . . makes any false, fictitious or fraudulent statements or representation, or makes or uses any false writing or document knowing the same to contain any false, fictitious or fraudulent statement or entry, shall be fined not more than \$250,000 or imprisoned not more than five years, or both."

In addition to the preceding warranty, the following items are covered by a company warranty or guarantee as follows:

Item	Serial & Model No.	Name and Address of Company	No. Yrs. or Mos. of Warranty
Heating System			
Kitchen Range			
Water Heater			
Refrigerator			
Manufactured Home			
Other			
Other			

NOTICE TO OWNERS: ANY NOTICE OF DEFECTIVE WORKMANSHIP, MATERIALS OR NONCONFORMITY MUST BE DELIVERED TO THE WARRANTOR NO LATER THAN

_____ .

(Warrantor shall insert date one (1) year from initial occupancy, date of conveyance of title or date of completion, whichever is applicable.) All plastic pipe used in this job will carry a 5-year warranty from the date shown by the Warrantor above.

We have furnished the above company warranties or guarantees to the Owners for their use. If this warranty covers a manufactured home, we certify that the manufactured home property substantially complies with the plans and specifications and the manufactured home sustained no hidden damage during transportation and, if manufactured in separate sections, that the sections were properly joined and sealed according to the manufacturer's specifications.

The Warrantor has signed this warranty this _____ day of _____ , _____ .

(Warrantor's Address)

Warrantor (Signature & Title)

Receipt of this warranty is acknowledged this _____ day of _____ , _____ .

Owner(s)

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 00 71 00

CONTRACTING DEFINITIONS

1. PART 1 GENERAL

1.1. APPLICABILITY: THESE DEFINITIONS ARE INTEGRAL TO THE AGREEMENT.

1.2. DEFINITIONS - DESIGN-BUILD DOCUMENTS

- 1.2.1. Contract Documents: As defined in the Agreement.
 - 1.2.1.1. At the time of execution of the Agreement, Contract Documents consist of the following:
 - A. The Agreement and Conditions of the Contract, and other documents listed on the Table of Contents under the heading Contracting Requirements.
 - 1.2.1.2. From time to time after execution of the Agreement, upon approval by the Whitefield Library, the following types of documents will be incorporated into Contract Documents:
 - A. Drawings and other documents documenting the design.
 - B. Construction drawings and specifications detailing the execution of the design.

1.3. DEFINITIONS - TIME PERIODS AND MILESTONE DATES

- 1.3.1. Construction Documents: The time period during which process working drawings, specifications, and other documents describing the work or a portion of the work are prepared in sufficient detail to allow accurate and complete construction.
- 1.3.2. Construction: The time period from the beginning of work on the project site until final payment as defined by the Conditions of the Contract.
- 1.3.3. Substantial Completion: The date as defined in the Conditions of the Contract. Date of Substantial Completion is the due date for the following:
 - 1.3.3.1. Contractor's complete punchlist of items to be completed.
 - 1.3.3.2. Whitefield Library's complete punchlist of items to be completed.
 - 1.3.3.3. Compliance with requirements of governing authorities, for submittals, inspections, and permits.
 - 1.3.3.4. Compliance with Whitefield Library's requirements for access to areas occupied by the Whitefield Library.
 - 1.3.3.5. Final cleaning.
 - 1.3.3.6. Training of Whitefield Library's personnel.
- 1.3.4. Closeout: The time period during which all details of both construction and commissioning are completed.
 - 1.3.4.1. The Closeout period is the time from Date of Substantial Completion until final payment, both as defined by the Conditions of the Contract.
 - 1.3.4.2. Before and during the Closeout period, the Whitefield Library will ascertain whether the completed project complies with Contract Documents.
- 1.3.5. Occupancy: The time period during which the project is occupied for its intended purpose.
 - 1.3.5.1. The Occupancy period begins at Date of Substantial Completion, as defined by the Conditions of the Contract.
- 1.3.6. Correction Period: The time period defined by the Conditions of the Contract.

2. PART 2 PRODUCTS - NOT USED

3. PART 3 EXECUTION - NOT USED

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 01 20 00

PRICE AND PAYMENT PROCEDURES

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Procedures for preparation and submittal of applications for progress payments.
- 1.1.2. Documentation of changes in Contract Sum and Contract Time.
- 1.1.3. Procedures for preparation and submittal of application for final payment.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 00 50 00 - Contracting Forms and Supplements: Forms to be used.
- 1.2.2. Section 01 78 00 - Closeout Submittals: Project record documents.

1.3. SCHEDULE OF VALUES

- 1.3.1. Use Schedule of Values Form: AIA G703, edition stipulated in the Agreement.
- 1.3.2. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to Alba Architects for approval.
- 1.3.3. Forms filled out by hand will not be accepted.
- 1.3.4. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification section.

1.4. APPLICATIONS FOR PROGRESS PAYMENTS

- 1.4.1. Payment Period: Submit at intervals stipulated in the Agreement.
- 1.4.2. Use Form AIA G702 and Form AIA G703, edition stipulated in the Agreement.
- 1.4.3. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Alba Architects for approval.
- 1.4.4. Forms filled out by hand will not be accepted.
- 1.4.5. Execute certification by signature of authorized officer.
- 1.4.6. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of work.
- 1.4.7. Submit one electronic and one hard-copies of each Application for Payment.

1.5. MODIFICATION PROCEDURES

- 1.5.1. For minor changes not involving an adjustment to the Contract Sum or Contract Time, Alba Architects will issue instructions directly to Contractor.
- 1.5.2. For other required changes, Alba Architects will issue a document signed by Whitefield Library instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.
 - 1.5.2.1. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
 - 1.5.2.2. Promptly execute the change.
- 1.5.3. For changes for which advance pricing is desired, Alba Architects will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change. Contractor shall prepare and submit a fixed price quotation within 14 days.

- 1.5.4. Contractor may propose a change by submitting a request for change to Alba Architects, describing the proposed change and its full effect on the work, with a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation.
- 1.5.5. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.

1.6. APPLICATION FOR FINAL PAYMENT

- 1.6.1. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 01 23 00

ALTERNATES

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Description of Alternates.
- 1.1.2. Procedures for pricing Alternates.

1.2. SCHEDULE OF ALTERNATES

- All Alternates are to be Deduct Alternates
- 1.2.1. Alternate No. 1 - Exterior Brick Veneer to New Addition.
Base Bid - Provide all products, components, systems and associated work as identified in Contract Documents.
Alternate - Deduct brick veneer at main level only (vertical area between horizontal trims).
Provide Hardie Architectural Panel in lieu of Brick Veneer.
- 1.2.2. Alternate No. 2 - Lighting throughout Original 1904 Library.
Base Bid - Provide all fixtures, components, systems and associated work as identified in Contract Documents.
Alternate - Deduct complete lighting scope of work to Original 1904 Library. All existing fixtures, components, and systems to remain.
- 1.2.3. Alternate No. 3 - Lighting throughout 2011 Library Addition.
Base Bid - Provide all fixtures, components, systems and associated work as identified in Contract Documents.
Alternate - Deduct complete lighting scope of work to 2011 Library Addition, other than that necessary for the new Study Room. All other existing fixtures, components, and systems to remain.

2. PART 2 PRODUCTS - NOT USED

3. PART 3 EXECUTION - NOT USED

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 01 25 00 SUBSTITUTION PROCEDURES

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Procedural requirements for proposed substitutions.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 00 63 25 - Substitution Request Form - During Construction: Required form for substitution requests made after award of contract (During construction).

1.3. DEFINITIONS

- 1.3.1. Substitutions: Changes from Contract Documents requirements proposed by Contractor to materials, products, assemblies, and equipment.
 - 1.3.1.1. Substitutions for Cause: Proposed due to changed Project circumstances beyond Contractor's control.
 - A. Unavailability.
 - B. Regulatory changes.
 - 1.3.1.2. Substitutions for Convenience: Proposed due to possibility of offering substantial advantage to the Project.
 - A. Substitution requests offering advantages solely to the Contractor will not be considered.

2. PART 2 PRODUCTS - NOT USED

3. PART 3 EXECUTION

3.1. GENERAL REQUIREMENTS

- 3.1.1. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:
 - 3.1.1.1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.
 - 3.1.1.2. Agrees to provide the same warranty for the substitution as for the specified product.
 - 3.1.1.3. Agrees to provide same or equivalent maintenance service and source of replacement parts, as applicable.
 - 3.1.1.4. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to Whitefield Library.
 - 3.1.1.5. Waives claims for additional costs or time extension that may subsequently become apparent.
 - 3.1.1.6. Agrees to reimburse Whitefield Library and Alba Architects for review or redesign services associated with re-approval by authorities.
- 3.1.2. A Substitution Request for specified installer constitutes a representation that the submitter:
 - 3.1.2.1. Has acted in good faith to obtain services of specified installer, but was unable to come to commercial, or other terms.

- 3.1.3. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer.
- 3.1.4. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.
 - 3.1.4.1. Forms indicated in the Project Manual are adequate for this purpose, and must be used.
- 3.1.5. Limit each request to a single proposed substitution item.
- 3.1.6. All products , or approved equals, are permitted at bidding consistent with RD Instruction 1942.18 (j) (2) & (4).

3.2. SUBSTITUTION PROCEDURES DURING CONSTRUCTION

- 3.2.1. Submittal Form (after award of contract):
 - 3.2.1.1. Submit substitution requests by completing the form in Section 00 63 25; see this section for additional information and instructions. Use only this form; other forms of submission are unacceptable.
- 3.2.2. Submit request for Substitution for Cause within 14 days of discovery of need for substitution, but not later than 14 days prior to time required for review and approval by Alba Architects, in order to stay on approved project schedule.
- 3.2.3. Submit request for Substitution for Convenience within 14 days of discovery of its potential advantage to the project, but not later than 14 days prior to time required for review and approval by Alba Architects, in order to stay on approved project schedule.
 - 3.2.3.1. In addition to meeting general documentation requirements, document how the requested substitution benefits the Whitefield Library through cost savings, time savings, greater energy conservation, or in other specific ways.
 - 3.2.3.2. Document means of coordinating of substitution item with other portions of the work, including work by affected subcontractors.
 - 3.2.3.3. Bear the costs engendered by proposed substitution of:
 - A. Whitefield Library's compensation to the Alba Architects for any required redesign, time spent processing and evaluating the request.
 - B. Other construction by Whitefield Library.
 - C. Other unanticipated project considerations.
- 3.2.4. Substitutions will not be considered under one or more of the following circumstances:
 - 3.2.4.1. When they are indicated or implied on shop drawing or product data submittals, without having received prior approval.
 - 3.2.4.2. Without a separate written request.
 - 3.2.4.3. When acceptance will require revisions to Contract Documents.

3.3. RESOLUTION

- 3.3.1. Alba Architects may request additional information and documentation prior to rendering a decision. Provide this data in an expeditious manner.
- 3.3.2. Alba Architects will notify Contractor in writing of decision to accept or reject request.
 - 3.3.2.1. Alba Architects's decision following review of proposed substitution will be noted on the submitted form.

3.4. ACCEPTANCE

- 3.4.1. Accepted substitutions change the work of the Project. They will be documented and incorporated into work of the project by Change Order, Construction Change Directive, Architectural Supplementary Instructions, or similar instruments provided for in the Conditions of the Contract.

3.5. CLOSEOUT ACTIVITIES

- 3.5.1. See Section 01 78 00 - Closeout Submittals, for closeout submittals.
- 3.5.2. Include completed Substitution Request Forms as part of the Project record. Include both approved and rejected Requests.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. General administrative requirements.
- 1.1.2. Preconstruction meeting.
- 1.1.3. Progress meetings.
- 1.1.4. Construction progress schedule.
- 1.1.5. Progress photographs.
- 1.1.6. Submittals for review, information, and project closeout.
- 1.1.7. Number of copies of submittals.
- 1.1.8. Requests for Interpretation (RFI) procedures.
- 1.1.9. Submittal procedures.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 01 60 00 - Product Requirements: General product requirements.
- 1.2.2. Section 01 70 00 - Execution and Closeout Requirements: Additional coordination requirements.
- 1.2.3. Section 01 78 00 - Closeout Submittals: Project record documents; operation and maintenance data; warranties and bonds.

1.3. REFERENCE STANDARDS

- 1.3.1. AIA G716 - Request for Information; 2004.
- 1.3.2. AIA G810 - Transmittal Letter; 2001.

1.4. GENERAL ADMINISTRATIVE REQUIREMENTS

- 1.4.1. Comply with requirements of Section 01 70 00 - Execution and Closeout Requirements for coordination of execution of administrative tasks with timing of construction activities.
- 1.4.2. Make the following types of submittals to Alba Architects:
 - 1.4.2.1. Requests for Interpretation (RFI).
 - 1.4.2.2. Requests for substitution.
 - 1.4.2.3. Shop drawings, product data, and samples.
 - 1.4.2.4. Test and inspection reports.
 - 1.4.2.5. Design data.
 - 1.4.2.6. Manufacturer's instructions and field reports.
 - 1.4.2.7. Applications for payment and change order requests.
 - 1.4.2.8. Progress schedules.
 - 1.4.2.9. Coordination drawings.
 - 1.4.2.10. Correction Punch List and Final Correction Punch List for Substantial Completion.
 - 1.4.2.11. Closeout submittals.

1.5. PROJECT COORDINATOR

- 1.5.1. Project Coordinator: Construction Manager.
- 1.5.2. During construction, coordinate use of site and facilities through the Project Coordinator.

- 1.5.3. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
- 1.5.4. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities. Responsibility for providing temporary utilities and construction facilities is identified in Section 01 10 00 - Summary.
- 1.5.5. Coordinate field engineering and layout work under instructions of the Project Coordinator.
- 1.5.6. Make the following types of submittals to Alba Architects through the Project Coordinator:
 - 1.5.6.1. Requests for Interpretation.
 - 1.5.6.2. Requests for substitution.
 - 1.5.6.3. Shop drawings, product data, and samples.
 - 1.5.6.4. Test and inspection reports.
 - 1.5.6.5. Manufacturer's instructions and field reports.
 - 1.5.6.6. Applications for payment and change order requests.
 - 1.5.6.7. Progress schedules.
 - 1.5.6.8. Correction Punch List and Final Correction Punch List for Substantial Completion.
 - 1.5.6.9. Closeout submittals.

2. PART 2 PRODUCTS - NOT USED

3. PART 3 EXECUTION

3.1. PRECONSTRUCTION MEETING

- 3.1.1. Project Coordinator will schedule a meeting after Notice of Award.
- 3.1.2. Attendance Required:
 - 3.1.2.1. Whitefield Library.
 - 3.1.2.2. Alba Architects.
 - 3.1.2.3. Contractor.
- 3.1.3. Agenda:
 - 3.1.3.1. Execution of Whitefield Library-Contractor Agreement.
 - 3.1.3.2. Submission of executed bonds and insurance certificates.
 - 3.1.3.3. Distribution of Contract Documents.
 - 3.1.3.4. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
 - 3.1.3.5. Designation of personnel representing the parties to Contract and Alba Architects.
 - 3.1.3.6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
 - 3.1.3.7. Scheduling.
- 3.1.4. Record minutes and distribute copies within two days after meeting to participants, with two copies to Alba Architects, Whitefield Library, participants, and those affected by decisions made.

3.2. PROGRESS MEETINGS

- 3.2.1. Schedule and administer meetings throughout progress of the work at maximum bi-monthly intervals.
- 3.2.2. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
- 3.2.3. Attendance Required:
 - 3.2.3.1. Contractor.
 - 3.2.3.2. Whitefield Library.
 - 3.2.3.3. Alba Architects.

- 3.2.3.4. Contractor's superintendent.
- 3.2.3.5. Major subcontractors.
- 3.2.4. Agenda:
 - 3.2.4.1. Review minutes of previous meetings.
 - 3.2.4.2. Review of work progress.
 - 3.2.4.3. Field observations, problems, and decisions.
 - 3.2.4.4. Identification of problems that impede, or will impede, planned progress.
 - 3.2.4.5. Review of submittals schedule and status of submittals.
 - 3.2.4.6. Review of RFIs log and status of responses.
 - 3.2.4.7. Maintenance of progress schedule.
 - 3.2.4.8. Corrective measures to regain projected schedules.
 - 3.2.4.9. Planned progress during succeeding work period.
 - 3.2.4.10. Maintenance of quality and work standards.
 - 3.2.4.11. Effect of proposed changes on progress schedule and coordination.
 - 3.2.4.12. Other business relating to work.
- 3.2.5. Record minutes and distribute copies within two days after meeting to participants, with two copies to Alba Architects, Whitefield Library, participants, and those affected by decisions made.

3.3. CONSTRUCTION PROGRESS SCHEDULE

- 3.3.1. Within 10 days after date of the Agreement, submit preliminary schedule defining planned operations for the first 60 days of work, with a general outline for remainder of work.
- 3.3.2. If preliminary schedule requires revision after review, submit revised schedule within 10 days.
- 3.3.3. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
 - 3.3.3.1. Include written certification that major contractors have reviewed and accepted proposed schedule.
- 3.3.4. Within 10 days after joint review, submit complete schedule.
- 3.3.5. Submit updated schedule with each Application for Payment.

3.4. PROGRESS PHOTOGRAPHS

- 3.4.1. Submit photographs with each application for payment, taken not more than 3 days prior to submission of application for payment.
- 3.4.2. Photography Type: Digital; electronic files.
- 3.4.3. Provide photographs of site and construction throughout progress of work produced by an experienced photographer, acceptable to Alba Architects.
- 3.4.4. In addition to periodic, recurring views, take photographs of each of the following events:
 - 3.4.4.1. Excavations in progress.
 - 3.4.4.2. Foundations in progress and upon completion.
 - 3.4.4.3. Structural framing in progress and upon completion.
 - 3.4.4.4. Enclosure of building, upon completion.
 - 3.4.4.5. Final completion, minimum of ten (10) photos.
- 3.4.5. Views:
 - 3.4.5.1. Provide non-aerial photographs from four cardinal views at each specified time, until date of Substantial Completion.
 - 3.4.5.2. Consult with Alba Architects for instructions on views required.
 - 3.4.5.3. Provide factual presentation.
 - 3.4.5.4. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.
- 3.4.6. Digital Photographs: 24 bit color, minimum resolution of 1280 by 960 ("1 megapixel"), in JPG format; provide files unaltered by photo editing software.

- 3.4.6.1. Delivery Medium: Via email.
- 3.4.6.2. File Naming: Include project identification, date and time of view, and view identification.
- 3.4.6.3. PDF File: Assemble all photos into printable pages in PDF format, with 2 to 3 photos per page, each photo labeled with file name; one PDF file per submittal.

3.5. REQUESTS FOR INFORMATION (RFI)

- 3.5.1. Definition: A request seeking one of the following:
 - 3.5.1.1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in Contract Documents.
 - 3.5.1.2. A resolution to an issue which has arisen due to field conditions and affects design intent.
- 3.5.2. Whenever possible, request clarifications at the next appropriate project progress meeting, with response entered into meeting minutes, rendering unnecessary the issuance of a formal RFI.
- 3.5.3. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
 - 3.5.3.1. Prepare a separate RFI for each specific item.
 - A. Review, coordinate, and comment on requests originating with subcontractors and/or materials suppliers.
 - B. Do not forward requests which solely require internal coordination between subcontractors.
 - 3.5.3.2. Prepare in a format and with content acceptable to Whitefield Library.
 - 3.5.3.3. Combine RFI and its attachments into a single electronic file. PDF format is preferred.
- 3.5.4. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
 - 3.5.4.1. Include in each request Contractor's signature attesting to good faith effort to determine from Contract Documents information requiring interpretation.
 - 3.5.4.2. Unacceptable Uses for RFIs: Do not use RFIs to request the following:
 - A. Approval of submittals (use procedures specified elsewhere in this section).
 - B. Approval of substitutions (see Section - 01 60 00 - Product Requirements)
 - C. Changes that entail change in Contract Time and Contract Sum (comply with provisions of the Conditions of the Contract).
 - D. Different methods of performing work than those indicated in the Contract Drawings and Specifications (comply with provisions of the Conditions of the Contract).
 - 3.5.4.3. Improper RFIs: Requests not prepared in compliance with requirements of this section, and/or missing key information required to render an actionable response. They will be returned without a response, with an explanatory notation.
 - 3.5.4.4. Frivolous RFIs: Requests regarding information that is clearly indicated on, or reasonably inferable from, Contract Documents, with no additional input required to clarify the question. They will be returned without a response, with an explanatory notation.
 - A. The Whitefield Library reserves the right to assess the Contractor for the costs (on time-and-materials basis) incurred by the Alba Architects, and any of its consultants, due to processing of such RFIs.
- 3.5.5. Content: Include identifiers necessary for tracking the status of each RFI, and information necessary to provide an actionable response.

- 3.5.5.1. Discrete and consecutive RFI number, and descriptive subject/title.
- 3.5.5.2. Issue date, and requested reply date.
- 3.5.5.3. Reference to particular Contract Document(s) requiring additional information/interpretation. Identify pertinent drawing and detail number and/or specification section number, title, and paragraph(s).
- 3.5.5.4. Annotations: Field dimensions and/or description of conditions which have engendered the request.
- 3.5.5.5. Contractor's suggested resolution: A written and/or a graphic solution, to scale, is required in cases where clarification of coordination issues is involved, for example; routing, clearances, and/or specific locations of work shown diagrammatically in Contract Documents. If applicable, state the likely impact of the suggested resolution on Contract Time or the Contract Sum.
- 3.5.6. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.
- 3.5.7. Review Time: Alba Architects will respond and return RFIs to Contractor within seven calendar days of receipt. For the purpose of establishing the start of the mandated response period, RFIs received after 12:00 noon will be considered as having been received on the following regular working day.
 - 3.5.7.1. Response period may be shortened or lengthened for specific items, subject to mutual agreement, and recorded in a timely manner in progress meeting minutes.
- 3.5.8. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor's belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to Whitefield Library.
 - 3.5.8.1. Response may include a request for additional information, in which case the original RFI will be deemed as having been answered, and an amended one is to be issued forthwith. Identify the amended RFI with an R suffix to the original number.
 - 3.5.8.2. Do not extend applicability of a response to specific item to encompass other similar conditions, unless specifically so noted in the response.
 - 3.5.8.3. Notify Alba Architects within seven calendar days if an additional or corrected response is required by submitting an amended version of the original RFI, identified as specified above.

3.6. SUBMITTALS FOR REVIEW

- 3.6.1. When the following are specified in individual sections, submit them for review:
 - 3.6.1.1. Product data.
 - 3.6.1.2. Shop drawings.
 - 3.6.1.3. Samples for selection.
 - 3.6.1.4. Samples for verification.
- 3.6.2. Submit to Alba Architects for review for the limited purpose of checking for compliance with information given and the design concept expressed in Contract Documents.
- 3.6.3. Samples will be reviewed for aesthetic, color, or finish selection.
- 3.6.4. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 78 00 - Closeout Submittals.

3.7. SUBMITTALS FOR INFORMATION

- 3.7.1. When the following are specified in individual sections, submit them for information:
 - 3.7.1.1. Design data.
 - 3.7.1.2. Certificates.
 - 3.7.1.3. Test reports.

- 3.7.1.4. Inspection reports.
- 3.7.1.5. Manufacturer's instructions.
- 3.7.1.6. Manufacturer's field reports.
- 3.7.1.7. Other types indicated.
- 3.7.2. Submit for Alba Architects's knowledge as contract administrator or for Whitefield Library.

3.8. SUBMITTALS FOR PROJECT CLOSEOUT

- 3.8.1. Submit Correction Punch List for Substantial Completion.
- 3.8.2. Submit Final Correction Punch List for Substantial Completion.
- 3.8.3. When the following are specified in individual sections, submit them at project closeout in compliance with requirements of Section 01 78 00 - Closeout Submittals:
 - 3.8.3.1. Project record documents.
 - 3.8.3.2. Operation and maintenance data.
 - 3.8.3.3. Warranties.
 - 3.8.3.4. Bonds.
 - 3.8.3.5. Other types as indicated.
- 3.8.4. Submit for Whitefield Library's benefit during and after project completion.

3.9. NUMBER OF COPIES OF SUBMITTALS

- 3.9.1. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.
- 3.9.2. Samples: Submit the number specified in individual specification sections; one of which will be retained by Alba Architects.
 - 3.9.2.1. After review, produce duplicates.
 - 3.9.2.2. Retained samples will not be returned to Contractor unless specifically so stated.

3.10. SUBMITTAL PROCEDURES

- 3.10.1. General Requirements:
 - 3.10.1.1. Use a separate transmittal for each item.
 - 3.10.1.2. Submit separate packages of submittals for review and submittals for information, when included in the same specification section.
 - 3.10.1.3. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.
 - 3.10.1.4. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.
 - A. Submittals from sources other than the Contractor, or without Contractor's stamp will not be acknowledged, reviewed, or returned.
 - 3.10.1.5. Schedule submittals to expedite the Project, and coordinate submission of related items.
 - A. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
 - B. For sequential reviews involving Alba Architects's consultants, Whitefield Library, or another affected party, allow an additional 7 days.
 - C. For sequential reviews involving approval from authorities having jurisdiction (AHJ), in addition to Alba Architects's approval, allow an additional 30 days.
 - 3.10.1.6. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.

- 3.10.1.7. Provide space for Contractor and Alba Architects review stamps.
- 3.10.1.8. Incomplete submittals will not be reviewed, unless they are partial submittals for distinct portion(s) of the work, and have received prior approval for their use.
- 3.10.1.9. Submittals not requested will be recognized, and will be returned "Not Reviewed",
- 3.10.2. Product Data Procedures:
 - 3.10.2.1. Submit only information required by individual specification sections.
 - 3.10.2.2. Collect required information into a single submittal.
 - 3.10.2.3. Submit concurrently with related shop drawing submittal.
 - 3.10.2.4. Do not submit (Material) Safety Data Sheets for materials or products.
- 3.10.3. Shop Drawing Procedures:
 - 3.10.3.1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.
 - 3.10.3.2. Do not reproduce Contract Documents to create shop drawings.
 - 3.10.3.3. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.
- 3.10.4. Samples Procedures:
 - 3.10.4.1. Transmit related items together as single package.
 - 3.10.4.2. Identify each item to allow review for applicability in relation to shop drawings showing installation locations.

3.11. SUBMITTAL REVIEW

- 3.11.1. Submittals for Review: Alba Architects will review each submittal, and approve, or take other appropriate action.
- 3.11.2. Submittals for Information: Alba Architects will acknowledge receipt and review. See below for actions to be taken.
- 3.11.3. Alba Architects's actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.
- 3.11.4. Alba Architects's and consultants' actions on items submitted for review:
 - 3.11.4.1. Authorizing purchasing, fabrication, delivery, and installation:
 - A. "Approved", or language with same legal meaning.
 - B. "Approved as Noted, Resubmission not required", or language with same legal meaning.
 - A) At Contractor's option, submit corrected item, with review notations acknowledged and incorporated.
 - C. "Approved as Noted, Resubmit for Record", or language with same legal meaning.
 - A) Resubmit corrected item, with review notations acknowledged and incorporated. Resubmit separately, or as part of project record documents.
 - 3.11.4.2. Not Authorizing fabrication, delivery, and installation:
 - A. "Revise and Resubmit".
 - A) Resubmit revised item, with review notations acknowledged and incorporated.
 - B. "Rejected".
 - A) Submit item complying with requirements of Contract Documents.
- 3.11.5. Alba Architects's and consultants' actions on items submitted for information:
 - 3.11.5.1. Items for which no action was taken:
 - A. "Received" - to notify the Contractor that the submittal has been received for record only.
 - 3.11.5.2. Items for which action was taken:
 - A. "Reviewed" - no further action is required from Contractor.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 01 32 16

CONSTRUCTION PROGRESS SCHEDULE

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Preliminary schedule.
- 1.1.2. Construction progress schedule, bar chart type.

1.2. SUBMITTALS

- 1.2.1. Within 10 days after date of Agreement, submit preliminary schedule.
- 1.2.2. If preliminary schedule requires revision after review, submit revised schedule within 10 days.
- 1.2.3. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
- 1.2.4. Submit updated schedule with each Application for Payment.
- 1.2.5. Submit in PDF format.

2. PART 2 PRODUCTS - NOT USED

3. PART 3 EXECUTION

3.1. PRELIMINARY SCHEDULE

- 3.1.1. Prepare preliminary schedule in the form of a horizontal bar chart.

3.2. CONTENT

- 3.2.1. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.
- 3.2.2. Identify each item by specification section number.
- 3.2.3. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.
- 3.2.4. Provide legend for symbols and abbreviations used.

3.3. BAR CHARTS

- 3.3.1. Include a separate bar for each major portion of Work or operation.
- 3.3.2. Identify the first work day of each week.

3.4. UPDATING SCHEDULE

- 3.4.1. Maintain schedules to record actual start and finish dates of completed activities.
 - 3.4.2. Indicate progress of each activity to date of revision, with projected completion date of each activity.
 - 3.4.3. Annotate diagrams to graphically depict current status of Work.
 - 3.4.4. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.
 - 3.4.5. Indicate changes required to maintain Date of Substantial Completion.
 - 3.4.6. Submit reports required to support recommended changes.
-

3.5. DISTRIBUTION OF SCHEDULE

- 3.5.1. Distribute copies of updated schedules to Contractor's project site file, to subcontractors, suppliers, Alba Architects, Whitefield Library, and other concerned parties.
- 3.5.2. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 01 35 91

PERIOD TREATMENT PROCEDURES

1. PART 1 - GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Construction procedures appropriate for working with historic sites and structures.
- 1.1.2. Special procedures required for items and features of historical significance and value requiring special treatment.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 02 03 42 - Removal and Salvage of Period Construction Materials.

1.3. DEFINITIONS

- 1.3.1. Consolidate: Strengthen loose or deteriorated materials in situ.
 - 1.3.2. Dismantle: Disassemble and detach items by hand from existing construction to the limits indicated, using small hand tools and small one-hand power tools, to protect nearby historic surfaces, and legally dispose of dismantled items off-site, unless indicated to be salvaged or reinstalled.
 - 1.3.3. Existing to Remain: Existing items that are not to be removed or dismantled. Protect materials as indicated.
 - 1.3.4. Historic: Spaces, areas, rooms, surfaces, materials, finishes, and overall appearance subject to preservation, rehabilitation, restoration, and reconstruction procedures defined in NPS (THP). Designation "HF" and words such as "historic," "historic fabric," "historic materials," "historic building materials," 'historic character,' or words of similar meaning indicate that the material or feature is considered to have aspects that require period treatment procedures.
 - 1.3.5. In-Kind: Matching existing in physical and visual aspects including, but not limited to, material, form, color, texture, and workmanship.
 - 1.3.6. Matching: Blending with adjacent construction and showing no apparent difference in material type, form, detail, color, texture, finish, or other visible and readily discernible characteristics, as determined and approved by Alba Architects.
 - 1.3.7. Preserve: Apply measures to sustain existing form, integrity, and materials of a historic property; may include preliminary measures to protect and stabilize the property.
 - 1.3.8. Protect: Take precautions to keep historic materials of the building from damage or injury.
 - 1.3.9. Reconstruct: Remove existing item, refurbish existing or replicate damaged or missing components as indicated or directed, and reinstall in original position.
 - 1.3.10. Refinish: Remove existing finishes from base material and apply new finish to match original or as otherwise indicated.
 - 1.3.11. Remove: Detach or dismantle items from existing construction and dispose of them off-site, unless items are indicated to be salvaged or reinstalled.
 - 1.3.12. Remove and Reinstall: Detach or dismantle items from existing construction in a manner to prevent damage. Clean and prepare for reuse and reinstall in original location or in other location where indicated.
 - 1.3.13. Remove and Salvage: Detach or dismantle items from existing construction in a manner to prevent damage. Clean, package, label, and deliver salvaged items to Whitefield Library in ready-for-reuse condition.
-

- 1.3.14. Repair: Correct damage and defects, retaining existing materials, features, and finishes and employing as few new materials as possible. Includes patching, piecing-in, splicing, consolidating, or reinforcing or upgrading materials with appropriate and approved materials and methods.
- 1.3.15. Replace: Remove, duplicate, and reinstall entire item with new material. Use original item as the pattern unless noted otherwise.
- 1.3.16. Replicate or Reproduce: Fabricate a new item in exact detail, materials, and finish as the original, unless otherwise indicated; referred to as replicas or reproductions.
- 1.3.17. Restore: Return to original condition; return to the condition extant during the period of interpretation.
- 1.3.18. Retain: Existing to remain; keep existing items that are not to be removed or dismantled.
- 1.3.19. Reversible: New construction work, treatment, or processes that can be removed or undone in the future without damaging historic materials.
- 1.3.20. Stabilize: Provide reinforcement of unsafe or deteriorated items and maintain the present, essential form; reestablish weather-resistant enclosure.
- 1.3.21. Strip: Remove existing finish down to base material, unless otherwise indicated.

1.4. REFERENCE STANDARDS

- 1.4.1. NPS (THP) - The Secretary of The Interior's Standards For the Treatment of Historic Properties with Guidelines For Preserving, Rehabilitating, Restoring & Reconstructing Historic Buildings; 2017.

1.5. SUBMITTALS

- 1.5.1. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- 1.5.2. Project Record Documents:
 - 1.5.2.1. Record of conditions encountered before, during, and after completion of work.

1.6. FIELD CONDITIONS

- 1.6.1. Smoking and use of tobacco products by personnel performing work on or about designated period treatment areas is not allowed.
- 1.6.2. Environmental Requirements:
 - 1.6.2.1. Wet or Humid Weather:
 - A. Do not remove exterior elements of structures when raining or rain is forecasted.
 - B. Do not apply primer, paint, putty, or epoxy when the relative humidity is above 80 percent and in accordance with manufacturer's recommendations.
 - C. Do not repair exterior features in rain or fog.
 - 1.6.2.2. Cold Weather: Do not perform exterior wet work when the air temperature is below 40 degrees F.
 - A. Cold Weather Minimum Application Ambient Temperatures:
 - A) Paint: 50 degrees F.
 - B) Putty: 50 degrees F.
 - C) Epoxy: 55 degrees F.
 - B. Do not begin cleaning, patching, and similar work when frost or freezing temperatures are forecasted.
- 1.6.3. Exterior Cleaning Procedures: Perform cleaning and rinsing of the exterior elements only during daylight hours.
- 1.6.4. Protection of Existing Elements: In accordance with manufacturer's recommendations for use of proposed products and procedures and compatibility with adjacent historic building materials, components, and vegetation.

2. PART 2 - PRODUCTS

2.1. PROTECTION PRODUCTS

- 2.1.1. Adhesive Walk-Off, Tacky Mats: Mats with multiple layers of disposable, adhesive-coated sheets.

2.2. CLEANING MATERIALS

- 2.2.1. General: Do not use incompatible materials that may contribute to damage of the element being cleaned.
- 2.2.2. Use products specifically intended by the manufacturer for cleaning historic materials or elements.

2.3. REPAIR MATERIALS

- 2.3.1. General: Do not use incompatible materials contributing to damage of repaired elements.
- 2.3.2. Matching: Unless otherwise required, use new materials that match historic materials in type, design, dimension, texture, detailing, and external appearance.

2.4. REFINISHING MATERIALS

- 2.4.1. General: Do not use incompatible materials that may contribute to damage of the element being refinished.
- 2.4.2. Matching: Unless otherwise required, use new materials that match historic materials in type, design, texture, detailing, and external appearance.

3. PART 3 - EXECUTION

3.1. PREPARATION

- 3.1.1. Dismantling: Follow the reverse order of original construction to the extent practicable.

3.2. PERIOD TREATMENT SPECIAL PROCEDURES

- 3.2.1. Selective removal and salvage of identified historic items and materials and removal of rubbish and debris.
- 3.2.2. Salvage as much existing material of each element as practicable; repair, consolidate, and restore rather than renew.
- 3.2.3. Repair rather than replace architectural features wherever possible. Repair or replace missing features with accurate duplications.
- 3.2.4. Use reversible processes wherever possible.
- 3.2.5. Use methods that do not significantly change the aesthetic effect of existing elements.
- 3.2.6. Document condition of items being worked on before, during, and after work is completed.
- 3.2.7. Notify Whitefield Library of visible changes in the integrity of material or components, e.g., environmental, such as biological attack, ultraviolet degradation, freeze-thaw, or structural defects such as cracks, movement, or distortion.
- 3.2.8. Protect existing materials and substrates from damage.
- 3.2.9. Exterior Work Procedures: Protect parts of the facility not included in this work from damage.
 - 3.2.9.1. Protect adjacent property from damage from this work.
 - 3.2.9.2. Do not attach scaffolding, ladders, and working platforms to building unless approved in writing by the Alba Architects.
- 3.2.10. Interior Work Procedures: Protect parts of the facility not being cleaned or repaired from effects of this work.

- 3.2.10.1. Provide enclosures to protect against spread of dust, debris, and water at or beyond the work area.
- 3.2.10.2. Mask or cover adjacent surfaces and permanent equipment. Secure coverings; do not use adhesive type tape or nails. Do not use impervious sheeting.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 01 40 00

QUALITY REQUIREMENTS

1. PART 1 GENERAL

1.1. RELATED REQUIREMENTS

- 1.1.1. Section 01 42 16 - Definitions.

1.2. DEFINITIONS

- 1.2.1. Contractor's Quality Control Plan: Contractor's management plan for executing the Contract for Construction.

1.3. SUBMITTALS

- 1.3.1. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- 1.3.2. Design Data: Submit for Alba Architects's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Whitefield Library's information.
 - 1.3.2.1. Include calculations that have been used to demonstrate compliance to performance and regulatory criteria provided, and to determine design solutions.
 - 1.3.2.2. Include required product data and shop drawings.
- 1.3.3. Test Reports: After each test/inspection, promptly submit two copies of report to Alba Architects and to Contractor.
 - 1.3.3.1. Test report submittals are for Alba Architects's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Whitefield Library's information.
- 1.3.4. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Whitefield Library's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.
- 1.3.5. Manufacturer's Field Reports: Submit reports for Alba Architects's benefit as contract administrator or for Whitefield Library.
 - 1.3.5.1. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents.

1.4. QUALITY ASSURANCE

- 1.4.1. Testing Agency Qualifications:
 - 1.4.1.1. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.

1.5. REFERENCES AND STANDARDS

- 1.5.1. Obtain copies of standards where required by product specification sections.
- 1.5.2. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.

1.6. TESTING AND INSPECTION AGENCIES AND SERVICES

- 1.6.1. Whitefield Library will employ and pay for services of an independent testing agency to perform other specified testing.
- 1.6.2. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

2. PART 2 PRODUCTS - NOT USED

3. PART 3 EXECUTION

3.1. CONTROL OF INSTALLATION

- 3.1.1. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.
- 3.1.2. Comply with manufacturers' instructions, including each step in sequence.
- 3.1.3. Should manufacturers' instructions conflict with Contract Documents, request clarification from Alba Architects before proceeding.
- 3.1.4. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- 3.1.5. Have work performed by persons qualified to produce required and specified quality.
- 3.1.6. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
- 3.1.7. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.2. MOCK-UPS

- 3.2.1. Before installing portions of the Work where mock-ups are required, construct mock-ups in location and size indicated for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work. The purpose of mock-up is to demonstrate the proposed range of aesthetic effects and workmanship.
- 3.2.2. Accepted mock-ups establish the standard of quality the Alba Architects will use to judge the Work.
- 3.2.3. Tests shall be performed under provisions identified in this section and identified in the respective product specification sections.
- 3.2.4. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.
- 3.2.5. Alba Architects will use accepted mock-ups as a comparison standard for the remaining Work.
- 3.2.6. Where mock-up has been accepted by Alba Architects and is specified in product specification sections to be removed, protect mock-up throughout construction, remove mock-up and clear area when directed to do so by Alba Architects.

3.3. TOLERANCES

- 3.3.1. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- 3.3.2. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Alba Architects before proceeding.
- 3.3.3. Adjust products to appropriate dimensions; position before securing products in place.

3.4. TESTING AND INSPECTION

- 3.4.1. Testing Agency Duties:
 - 3.4.1.1. Provide qualified personnel at site. Cooperate with Alba Architects and Contractor in performance of services.
 - 3.4.1.2. Perform specified sampling and testing of products in accordance with specified standards.
 - 3.4.1.3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 - 3.4.1.4. Promptly notify Alba Architects and Contractor of observed irregularities or non-compliance of Work or products.
 - 3.4.1.5. Perform additional tests and inspections required by Alba Architects.
 - 3.4.1.6. Submit reports of all tests/inspections specified.
- 3.4.2. Limits on Testing/Inspection Agency Authority:
 - 3.4.2.1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 - 3.4.2.2. Agency may not approve or accept any portion of the Work.
 - 3.4.2.3. Agency may not assume any duties of Contractor.
 - 3.4.2.4. Agency has no authority to stop the Work.
- 3.4.3. Contractor Responsibilities:
 - 3.4.3.1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
 - 3.4.3.2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
 - 3.4.3.3. Provide incidental labor and facilities:
 - A. To provide access to Work to be tested/inspected.
 - B. To obtain and handle samples at the site or at source of Products to be tested/inspected.
 - C. To facilitate tests/inspections.
 - D. To provide storage and curing of test samples.
 - 3.4.3.4. Notify Alba Architects and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
 - 3.4.3.5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
 - 3.4.3.6. Arrange with Whitefield Library's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
- 3.4.4. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Alba Architects.
- 3.4.5. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

3.5. DEFECT ASSESSMENT

- 3.5.1. Replace Work or portions of the Work not complying with specified requirements.
- 3.5.2. If, in the opinion of Alba Architects, it is not practical to remove and replace the work, Alba Architects will direct an appropriate remedy or adjust payment.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 01 41 00

REGULATORY REQUIREMENTS

1. PART 1 GENERAL

1.1. SUMMARY OF REFERENCE STANDARDS

- 1.1.1. Regulatory requirements applicable to this project are the following:
- 1.1.2. 29 CFR 1910 - Occupational Safety and Health Standards; Current Edition.
- 1.1.3. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.
- 1.1.4. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- 1.1.5. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- 1.1.6. ICC (IECC) - International Energy Conservation Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- 1.1.7. ICC (IMC) - International Mechanical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- 1.1.8. ICC (IPC) - International Plumbing Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- 1.1.9. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
- 1.1.10. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- 1.1.11. NFPA 101 - Life Safety Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- 1.1.12. Existing Building Code: Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- 1.1.13. ABAAS - Architectural Barriers Act Accessibility Standards; Most Recent Edition.

2. PART 2 PRODUCTS - NOT USED

3. PART 3 EXECUTION - NOT USED

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 01 42 16

DEFINITIONS

1. PART 1 GENERAL

1.1. SUMMARY

- 1.1.1. Other definitions are included in individual specification sections.

1.2. DEFINITIONS

- 1.2.1. Furnish: To supply, deliver, unload, and inspect for damage.
- 1.2.2. Install: To unpack, assemble, erect, apply, place, finish, cure, protect, clean, start up, and make ready for use.
- 1.2.3. Product: Material, machinery, components, equipment, fixtures, and systems forming the work result. Not materials or equipment used for preparation, fabrication, conveying, or erection and not incorporated into the work result. Products may be new, never before used, or re-used materials or equipment.
- 1.2.4. Project Manual: The book-sized volume that includes the procurement requirements (if any), the contracting requirements, and the specifications.
- 1.2.5. Provide: To furnish and install.
- 1.2.6. Supply: Same as Furnish.

2. PART 2 PRODUCTS - NOT USED

3. PART 3 EXECUTION - NOT USED

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 01 42 19
REFERENCE STANDARDS

1. PART 1 GENERAL

1.1. QUALITY ASSURANCE

- 1.1.1. For products or workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- 1.1.2. Comply with the reference standard of date of issue specified in this section, except where a specific date is established by applicable code.
- 1.1.3. Should specified reference standards conflict with Contract Documents, request clarification from the Alba Architects before proceeding.
- 1.1.4. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of the Alba Architects shall be altered by Contract Documents by mention or inference otherwise in any reference document.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Temporary utilities.
- 1.1.2. Temporary telecommunications services.
- 1.1.3. Temporary sanitary facilities.
- 1.1.4. Temporary Controls: Barriers, enclosures, and fencing.
- 1.1.5. Security requirements.
- 1.1.6. Vehicular access and parking.
- 1.1.7. Waste removal facilities and services.
- 1.1.8. Project identification sign.

1.2. REFERENCE STANDARDS

- 1.2.1. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- 1.2.2. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.

1.3. TEMPORARY UTILITIES

- 1.3.1. Whitefield Library will provide the following:
 - 1.3.1.1. Electrical power and metering, consisting of connection to existing facilities.
 - 1.3.1.2. Water supply, consisting of connection to existing facilities.

1.4. TELECOMMUNICATIONS SERVICES

- 1.4.1. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.

1.5. TEMPORARY SANITARY FACILITIES

- 1.5.1. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
- 1.5.2. Use of existing facilities located at project site is not permitted.
- 1.5.3. Maintain daily in clean and sanitary condition.

1.6. BARRIERS

- 1.6.1. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
- 1.6.2. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.
- 1.6.3. Provide protection for plants designated to remain. Replace damaged plants.
- 1.6.4. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.7. FENCING

- 1.7.1. Construction: Contractor's option.

1.8. EXTERIOR ENCLOSURES

- 1.8.1. Provide temporary insulated weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

1.9. INTERIOR ENCLOSURES

- 1.9.1. Provide temporary partitions and ceilings as indicated to separate work areas from Whitefield Library-occupied areas, to prevent penetration of dust and moisture into Whitefield Library-occupied areas, and to prevent damage to existing materials and equipment.
- 1.9.2. Construction: Framing and reinforced polyethylene sheet materials with closed joints and sealed edges at intersections with existing surfaces:

1.10. SECURITY

- 1.10.1. Provide security and facilities to protect Work, existing facilities, and Whitefield Library's operations from unauthorized entry, vandalism, or theft.
- 1.10.2. Coordinate with Whitefield Library's security program.

1.11. VEHICULAR ACCESS AND PARKING

- 1.11.1. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.
- 1.11.2. Coordinate access and haul routes with governing authorities and Whitefield Library.
- 1.11.3. Provide and maintain access to fire hydrants, free of obstructions.
- 1.11.4. Provide means of removing mud from vehicle wheels before entering streets.
- 1.11.5. Designated existing on-site roads may be used for construction traffic.
- 1.11.6. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.
- 1.11.7. Existing parking areas located at project site may be used for construction parking.

1.12. WASTE REMOVAL

- 1.12.1. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
- 1.12.2. Provide containers with lids. Remove trash from site periodically.
- 1.12.3. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.
- 1.12.4. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.13. PROJECT IDENTIFICATION

- 1.13.1. Provide project identification sign of design and construction indicated on drawings.
- 1.13.2. Erect on site at location indicated.
- 1.13.3. No other signs are allowed without Whitefield Library permission except those required by law.

1.14. REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- 1.14.1. Remove temporary utilities, equipment, facilities, materials, prior to Date of Substantial Completion inspection.
- 1.14.2. Clean and repair damage caused by installation or use of temporary work.
- 1.14.3. Restore existing facilities used during construction to original condition.
- 1.14.4. Restore new permanent facilities used during construction to specified condition.

2. PART 2 PRODUCTS - NOT USED

3. PART 3 EXECUTION - NOT USED

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 01 57 13

TEMPORARY EROSION AND SEDIMENT CONTROL

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Prevention of erosion due to construction activities.
- 1.1.2. Prevention of sedimentation of waterways, open drainage ways, and storm and sanitary sewers due to construction activities.
- 1.1.3. Restoration of areas eroded due to insufficient preventive measures.
- 1.1.4. Compensation of Whitefield Library for fines levied by authorities having jurisdiction due to non-compliance by Contractor.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 32 15 00 - Aggregate Surfacing: Temporary and permanent roadways.

1.3. REFERENCE STANDARDS

- 1.3.1. ASTM D4355/D4355M - Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc-Type Apparatus; 2021.
- 1.3.2. ASTM D4491/D4491M - Standard Test Methods for Water Permeability of Geotextiles by Permittivity; 2022.
- 1.3.3. ASTM D4533/D4533M - Standard Test Method for Trapezoid Tearing Strength of Geotextiles; 2015 (Reapproved 2023).
- 1.3.4. ASTM D4632/D4632M - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles; 2015a (Reapproved 2023).
- 1.3.5. ASTM D4751 - Standard Test Methods for Determining Apparent Opening Size of a Geotextile; 2021a.
- 1.3.6. ASTM D4873/D4873M - Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples; 2017 (Reapproved 2021).
- 1.3.7. EPA (NPDES) - National Pollutant Discharge Elimination System (NPDES), Construction General Permit; Current Edition.
- 1.3.8. FHWA FLP-94-005 - Best Management Practices for Erosion and Sediment Control; 1995.
- 1.3.9. USDA TR-55 - Urban Hydrology for Small Watersheds; USDA Natural Resources Conservation Service; 2015.

1.4. PERFORMANCE REQUIREMENTS

- 1.4.1. Comply with requirements of EPA (NPDES) for erosion and sedimentation control, as specified by the NPDES, for Phases I and II, and in compliance with requirements of Construction General Permit (CGP).
- 1.4.2. Also comply with all more stringent requirements of State of New Hampshire Erosion and Sedimentation Control Manual.
- 1.4.3. Best Management Practices Standard: FHWA FLP-94-005.
- 1.4.4. Develop and follow an Erosion and Sedimentation Prevention Plan and submit periodic inspection reports.

- 1.4.5. Do not begin clearing, grading, or other work involving disturbance of ground surface cover until applicable permits have been obtained; furnish all documentation required to obtain applicable permits.
- 1.4.6. Timing: Put preventive measures in place as soon as possible after disturbance of surface cover and before precipitation occurs.
- 1.4.7. Storm Water Runoff: Control increased storm water runoff due to disturbance of surface cover due to construction activities for this project.
 - 1.4.7.1. Prevent runoff into storm and sanitary sewer systems, including open drainage channels, in excess of actual capacity or amount allowed by authorities having jurisdiction, whichever is less.
 - 1.4.7.2. Anticipate runoff volume due to the most extreme short term and 24-hour rainfall events that might occur in 25 years.
- 1.4.8. Erosion On Site: Minimize wind, water, and vehicular erosion of soil on project site due to construction activities for this project.
 - 1.4.8.1. Control movement of sediment and soil from temporary stockpiles of soil.
 - 1.4.8.2. Prevent development of ruts due to equipment and vehicular traffic.
 - 1.4.8.3. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Whitefield Library.
- 1.4.9. Erosion Off Site: Prevent erosion of soil and deposition of sediment on other properties caused by water leaving the project site due to construction activities for this project.
 - 1.4.9.1. Prevent windblown soil from leaving the project site.
 - 1.4.9.2. Prevent tracking of mud onto public roads outside site.
 - 1.4.9.3. Prevent mud and sediment from flowing onto sidewalks and pavements.
 - 1.4.9.4. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Whitefield Library.
- 1.4.10. Sedimentation of Waterways On Site: Prevent sedimentation of waterways on the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
 - 1.4.10.1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Whitefield Library; remove deposited sediments; comply with requirements of authorities having jurisdiction.
 - 1.4.10.2. If sediment basins are used as temporary preventive measures, pump dry and remove deposited sediment after each storm.
- 1.4.11. Sedimentation of Waterways Off Site: Prevent sedimentation of waterways off the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
 - 1.4.11.1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Whitefield Library; remove deposited sediments; comply with requirements of authorities having jurisdiction.
- 1.4.12. Open Water: Prevent standing water that could become stagnant.
- 1.4.13. Maintenance: Maintain temporary preventive measures until permanent measures have been established.

1.5. SUBMITTALS

- 1.5.1. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- 1.5.2. Certificate: Mill certificate for silt fence fabric attesting that fabric and factory seams comply with specified requirements, signed by legally authorized official of manufacturer; indicate actual minimum average roll values; identify fabric by roll identification numbers.

2. PART 2 PRODUCTS

2.1. MATERIALS

- 2.1.1. Mulch: Use one of the following:
 - 2.1.1.1. Straw or hay.
 - 2.1.1.2. Erosion control matting or netting.
- 2.1.2. Grass Seed For Temporary Cover: Select a species appropriate to climate, planting season, and intended purpose. If same area will later be planted with permanent vegetation, do not use species known to be excessively competitive or prone to volunteer in subsequent seasons.
- 2.1.3. Bales: Air dry, rectangular straw bales.
 - 2.1.3.1. Cross Section: 14 by 18 inches, minimum.
 - 2.1.3.2. Bindings: Wire or string, around long dimension.
- 2.1.4. Bale Stakes: One of the following, minimum 3 feet long:
 - 2.1.4.1. Steel U- or T-section, with minimum mass of 1.33 pound per linear foot.
 - 2.1.4.2. Wood, 2 by 2 inches in cross section.
- 2.1.5. Silt Fence Fabric: Polypropylene geotextile resistant to common soil chemicals, mildew, and insects; non-biodegradable; in longest lengths possible; fabric including seams with the following minimum average roll lengths:
 - 2.1.5.1. Average Opening Size: 30 U.S. Std. Sieve, maximum, when tested in accordance with ASTM D4751.
 - 2.1.5.2. Permittivity: 0.05 sec^{-1} , minimum, when tested in accordance with ASTM D4491/D4491M.
 - 2.1.5.3. Ultraviolet Resistance: Retaining at least 70 percent of tensile strength, when tested in accordance with ASTM D4355/D4355M after 500 hours exposure.
 - 2.1.5.4. Tensile Strength: 100 pounds-force, minimum, in cross-machine direction; 124 pounds-force, minimum, in machine direction; when tested in accordance with ASTM D4632/D4632M.
 - 2.1.5.5. Elongation: 15 to 30 percent, when tested in accordance with ASTM D4632/D4632M.
 - 2.1.5.6. Tear Strength: 55 pounds-force, minimum, when tested in accordance with ASTM D4533/D4533M.
 - 2.1.5.7. Color: Manufacturer's standard, with embedment and fastener lines preprinted.
- 2.1.6. Silt Fence Posts: One of the following, minimum 5 feet long:
- 2.1.7. Gravel: See Section 31 23 23 for aggregate.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Examine site and identify existing features that contribute to erosion resistance; maintain such existing features to greatest extent possible.

3.2. PREPARATION

- 3.2.1. Schedule work so that soil surfaces are left exposed for the minimum amount of time.

3.3. SCOPE OF PREVENTIVE MEASURES

- 3.3.1. In all cases, if permanent erosion resistant measures have been installed temporary preventive measures are not required.
 - 3.3.2. Construction Entrances: Traffic-bearing aggregate surface.
 - 3.3.2.1. Width: As required; 20 feet, minimum.
 - 3.3.2.2. Length: 50 feet, minimum.
-

- 3.3.2.3. Provide at each construction entrance from public right-of-way.
- 3.3.2.4. Where necessary to prevent tracking of mud onto right-of-way, provide wheel washing area out of direct traffic lane, with drain into sediment trap or basin.
- 3.3.3. Linear Sediment Barriers: Made of silt fences.
 - 3.3.3.1. Provide linear sediment barriers:
 - A. Along downhill perimeter edge of disturbed areas, including soil stockpiles.
 - 3.3.3.2. Space sediment barriers with the following maximum slope length upslope from barrier:
 - A. Slope of Less Than 2 Percent: 100 feet..
 - B. Slope Between 2 and 5 Percent: 75 feet.
 - C. Slope Between 5 and 10 Percent: 50 feet.
 - D. Slope Between 10 and 20 Percent: 25 feet.
 - E. Slope Over 20 Percent: 15 feet.
- 3.3.4. Storm Drain Curb Inlet Sediment Trap: Protect each curb inlet using one of the following measures:
 - 3.3.4.1. Filter fabric wrapped around hollow concrete blocks blocking entire inlet face area; use one piece of fabric wrapped at least 1-1/2 times around concrete blocks and secured to prevent dislodging; orient cores of blocks so runoff passes into inlet.
 - 3.3.4.2. Straw bale row blocking entire inlet face area; anchor into pavement.
- 3.3.5. Storm Drain Drop Inlet Sediment Traps: As detailed on drawings.
- 3.3.6. Temporary Splash Pads: Stone aggregate over filter fabric; size to suit application; provide at downspout outlets and storm water outlets.
- 3.3.7. Soil Stockpiles: Protect using one of the following measures:
 - 3.3.7.1. Cover with polyethylene film, secured by placing soil on outer edges.
 - 3.3.7.2. Cover with mulch at least 4 inches thickness of pine needles, sawdust, bark, wood chips, or shredded leaves, or 6 inches of straw or hay.
- 3.3.8. Mulching: Use only for areas that may be subjected to erosion for less than 6 months.
- 3.3.9. Temporary Seeding: Use where temporary vegetated cover is required.

3.4. INSTALLATION

- 3.4.1. Traffic-Bearing Aggregate Surface:
 - 3.4.1.1. Excavate minimum of 6 inches.
 - 3.4.1.2. Place geotextile fabric full width and length, with minimum 12 inch overlap at joints.
 - 3.4.1.3. Place and compact at least 6 inches of 1 1/2 to 3 1/2 inch diameter stone.
- 3.4.2. Silt Fences:
 - 3.4.2.1. Store and handle fabric in accordance with ASTM D4873/D4873M.
 - 3.4.2.2. Where slope gradient is less than 3:1 or barriers will be in place less than 6 months, use nominal 16 inch high barriers with minimum 36 inch long posts spaced at 6 feet maximum, with fabric embedded at least 4 inches in ground.
 - 3.4.2.3. Where slope gradient is steeper than 3:1 or barriers will be in place over 6 months, use nominal 28 inch high barriers, minimum 48 inch long posts spaced at 6 feet maximum, with fabric embedded at least 6 inches in ground.
 - 3.4.2.4. Where slope gradient is steeper than 3:1 and vertical height of slope between barriers is more than 20 feet, use nominal 32 inch high barriers with woven wire reinforcement and steel posts spaced at 4 feet maximum, with fabric embedded at least 6 inches in ground.
 - 3.4.2.5. Install with top of fabric at nominal height and embedment as specified.
 - 3.4.2.6. Do not splice fabric width; minimize splices in fabric length; splice at post only, overlapping at least 18 inches, with extra post.
 - 3.4.2.7. Wherever runoff will flow around end of barrier or over the top, provide temporary splash pad or other outlet protection; at such outlets in the run of the barrier, make barrier not more than 12 inches high with post spacing not more than 4 feet.

- 3.4.3. Straw Bale Rows:
 - 3.4.3.1. Install bales in continuous rows with ends butting tightly, with one bale at each end of row turned uphill.
 - 3.4.3.2. Install bales so that bindings are not in contact with the ground.
 - 3.4.3.3. Embed bales at least 4 inches in the ground.
 - 3.4.3.4. Anchor bales with at least two stakes per bale, driven at least 18 inches into the ground; drive first stake in each bale toward the previously placed bale to force bales together.
 - 3.4.3.5. Fill gaps between ends of bales with loose straw wedged tightly.
 - 3.4.3.6. Place soil excavated for trench against bales on the upslope side of the row, compacted.
- 3.4.4. Temporary Seeding:
 - 3.4.4.1. When hydraulic seeder is used, seedbed preparation is not required.
 - 3.4.4.2. When surface soil has been sealed by rainfall or consists of smooth undisturbed cut slopes, and conventional or manual seeding is to be used, prepare seedbed by scarifying sufficiently to allow seed to lodge and germinate.
 - 3.4.4.3. If temporary mulching was used on planting area but not removed, apply nitrogen fertilizer at 1 pound per 1000 sq ft.
 - 3.4.4.4. On soils of very low fertility, apply 10-10-10 fertilizer at rate of 12 to 16 pounds per 1000 sq ft.
 - 3.4.4.5. Incorporate fertilizer into soil before seeding.
 - 3.4.4.6. Apply seed uniformly; if using drill or cultipacker seeders place seed 1/2 to 1 inch deep.
 - 3.4.4.7. Irrigate as required to thoroughly wet soil to depth that will ensure germination, without causing runoff or erosion.
 - 3.4.4.8. Repeat irrigation as required until grass is established.

3.5. MAINTENANCE

- 3.5.1. Inspect preventive measures weekly, within 24 hours after the end of any storm that produces 0.5 inches or more rainfall at the project site, and daily during prolonged rainfall.
- 3.5.2. Repair deficiencies immediately.
- 3.5.3. Silt Fences:
 - 3.5.3.1. Promptly replace fabric that deteriorates unless need for fence has passed.
 - 3.5.3.2. Remove silt deposits that exceed one-third of the height of the fence.
 - 3.5.3.3. Repair fences that are undercut by runoff or otherwise damaged, whether by runoff or other causes.
- 3.5.4. Straw Bale Rows:
 - 3.5.4.1. Promptly replace bales that fall apart or otherwise deteriorate unless need has passed.
 - 3.5.4.2. Remove silt deposits that exceed one-half of the height of the bales.
 - 3.5.4.3. Repair bale rows that are undercut by runoff or otherwise damaged, whether by runoff or other causes.
- 3.5.5. Clean out temporary sediment control structures weekly and relocate soil on site.
- 3.5.6. Place sediment in appropriate locations on site; do not remove from site.

3.6. CLEAN UP

- 3.6.1. Remove temporary measures after permanent measures have been installed, unless permitted to remain by Alba Architects.
- 3.6.2. Clean out temporary sediment control structures that are to remain as permanent measures.
- 3.6.3. Where removal of temporary measures would leave exposed soil, shape surface to an acceptable grade and finish to match adjacent ground surfaces.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 01 60 00

PRODUCT REQUIREMENTS

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. General product requirements.
- 1.1.2. Re-use of existing products.
- 1.1.3. Transportation, handling, storage and protection.
- 1.1.4. Product option requirements.
- 1.1.5. Substitution limitations.
- 1.1.6. Maintenance materials, including extra materials, spare parts, tools, and software.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 01 25 00 - Substitution Procedures: Substitutions made during procurement and/or construction phases.
- 1.2.2. Section 01 40 00 - Quality Requirements: Product quality monitoring.
- 1.2.3. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions: Requirements for VOC-restricted product categories.

1.3. REFERENCE STANDARDS

- 1.3.1. ASTM D6866 - Standard Test Methods for Determining the Biobased Content of Solid, Liquid, and Gaseous Samples Using Radiocarbon Analysis; 2024a.
- 1.3.2. GreenScreen (LIST) - GreenScreen for Safer Chemicals List Translator; Clean Production Action; Current Edition.
- 1.3.3. GreenScreen (METH) - GreenScreen for Safer Chemicals Method v1.2; Clean Production Action; Current Edition.
- 1.3.4. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.4. SUBMITTALS

- 1.4.1. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- 1.4.2. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- 1.4.3. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
 - 1.4.3.1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

2. PART 2 PRODUCTS

2.1. EXISTING PRODUCTS

- 2.1.1. Do not use materials and equipment removed from existing premises unless specifically required or permitted by Contract Documents.
- 2.1.2. Unforeseen historic items encountered remain the property of the Whitefield Library; notify Whitefield Library promptly upon discovery; protect, remove, handle, and store as directed by Whitefield Library.
- 2.1.3. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Whitefield Library, or otherwise indicated as to remain the property of the Whitefield Library, become the property of the Contractor; remove from site.

2.2. NEW PRODUCTS

- 2.2.1. Provide new products unless specifically required or permitted by Contract Documents.
- 2.2.2. See Section 01 40 00 - Quality Requirements, for additional source quality control requirements.
- 2.2.3. Use of products having any of the following characteristics is not permitted:
 - 2.2.3.1. Made using or containing CFC's or HCFC's.
 - 2.2.3.2. Containing lead, cadmium, or asbestos.
- 2.2.4. Where other criteria are met, Contractor shall give preference to products that:
 - 2.2.4.1. If used on interior, have lower emissions, as defined in Section 01 61 16.
 - 2.2.4.2. If wet-applied, have lower VOC content, as defined in Section 01 61 16.

2.3. PRODUCT OPTIONS

- 2.3.1. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description, or approved equal.
- 2.3.2. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, or approved equal.
- 2.3.3. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named, approved equals will be permitted.
- 2.3.4. Products Specified as Basis-of-Design: Submit substitution requests for unnamed products to Alba Architects for evaluation.

2.4. MAINTENANCE MATERIALS

- 2.4.1. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.
- 2.4.2. Deliver to Project site; obtain receipt prior to final payment.

3. PART 3 EXECUTION

3.1. SUBSTITUTION LIMITATIONS

- 3.1.1. See Section 01 25 00 - Substitution Procedures.

3.2. TRANSPORTATION AND HANDLING

- 3.2.1. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.
- 3.2.2. If special precautions are required, attach instructions prominently and legibly on outside of packaging.

- 3.2.3. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- 3.2.4. Transport and handle products in accordance with manufacturer's instructions.
- 3.2.5. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
- 3.2.6. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- 3.2.7. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.
- 3.2.8. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.3. STORAGE AND PROTECTION

- 3.3.1. Provide protection of stored materials and products against theft, casualty, or deterioration.
- 3.3.2. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication. See Section 01 74 19.
- 3.3.3. Store and protect products in accordance with manufacturers' instructions.
- 3.3.4. Store with seals and labels intact and legible.
- 3.3.5. Store sensitive products in weathertight, climate-controlled enclosures in an environment favorable to product.
- 3.3.6. For exterior storage of fabricated products, place on sloped supports above ground.
- 3.3.7. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.
- 3.3.8. Comply with manufacturer's warranty conditions, if any.
- 3.3.9. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- 3.3.10. Prevent contact with material that may cause corrosion, discoloration, or staining.
- 3.3.11. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- 3.3.12. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 01 61 16

VOLATILE ORGANIC COMPOUND (VOC) CONTENT RESTRICTIONS

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Requirements for Indoor-Emissions-Restricted products.
- 1.1.2. Requirements for VOC-Content-Restricted products.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 01 30 00 - Administrative Requirements: Submittal procedures.
- 1.2.2. Section 01 60 00 - Product Requirements: Fundamental product requirements, substitutions and product options, delivery, storage, and handling.

1.3. DEFINITIONS

- 1.3.1. Indoor-Emissions-Restricted Products: All products in the following product categories, whether specified or not:
 - 1.3.1.1. Interior paints and coatings applied on site.
 - 1.3.1.2. Interior adhesives and sealants applied on site, including flooring adhesives.
 - 1.3.1.3. Flooring.
 - 1.3.1.4. Composite wood.
 - 1.3.1.5. Products making up wall and ceiling assemblies.
 - 1.3.1.6. Thermal and acoustical insulation.
- 1.3.2. VOC-Content-Restricted Products: All products in the following product categories, whether specified or not:
 - 1.3.2.1. Interior paints and coatings applied on site.
 - 1.3.2.2. Interior adhesives and sealants applied on site, including flooring adhesives.
- 1.3.3. Interior of Building: Anywhere inside the exterior weather barrier.
- 1.3.4. Adhesives: All gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.
- 1.3.5. Sealants: All gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.
- 1.3.6. Inherently Non-Emitting Materials: Products composed wholly of minerals or metals, unless they include organic-based surface coatings, binders, or sealants; and specifically the following:
 - 1.3.6.1. Concrete.
 - 1.3.6.2. Clay brick.
 - 1.3.6.3. Metals that are plated, anodized, or powder-coated.
 - 1.3.6.4. Glass.
 - 1.3.6.5. Ceramics.
 - 1.3.6.6. Solid wood flooring that is unfinished and untreated.

1.4. REFERENCE STANDARDS

- 1.4.1. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; Current Edition.
- 1.4.2. ASTM D3960 - Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings; 2025.

- 1.4.3. CARB (SCM) - Suggested Control Measure for Architectural Coatings; California Air Resources Board; 2020.
- 1.4.4. SCAQMD 1113 - Architectural Coatings; 1977, with Amendment (2016).
- 1.4.5. SCAQMD 1168 - Adhesive and Sealant Applications; 1989, with Amendment (2022).

1.5. SUBMITTALS

- 1.5.1. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- 1.5.2. Product Data: For each VOC-restricted product used in the project, submit evidence of compliance.

1.6. QUALITY ASSURANCE

- 1.6.1. VOC Content Test Method: 40 CFR 59, Subpart D (EPA Method 24), or ASTM D3960, unless otherwise indicated.
 - 1.6.1.1. Evidence of Compliance: Acceptable types of evidence are:
 - A. Report of laboratory testing performed in accordance with requirements.
- 1.6.2. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

2. PART 2 PRODUCTS

2.1. MATERIALS

- 2.1.1. VOC-Content-Restricted Products: VOC content not greater than required by the following:
 - 2.1.1.1. Adhesives, Including Flooring Adhesives: SCAQMD 1168 Rule.
 - 2.1.1.2. Joint Sealants: SCAQMD 1168 Rule.
 - 2.1.1.3. Paints and Coatings: Each color; most stringent of the following:
 - A. 40 CFR 59, Subpart D.
 - B. SCAQMD 1113 Rule.
 - C. CARB (SCM).

3. PART 3 EXECUTION

3.1. FIELD QUALITY CONTROL

- 3.1.1. Whitefield Library reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to Whitefield Library.
- 3.1.2. Additional costs to restore indoor air quality due to installation of non-compliant products will be borne by Contractor.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 01 70 00

EXECUTION AND CLOSEOUT REQUIREMENTS

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Examination, preparation, and general installation procedures.
- 1.1.2. Requirements for alterations work, including selective demolition, _____.
- 1.1.3. Cutting and patching.
- 1.1.4. Surveying for laying out the work.
- 1.1.5. Cleaning and protection.
- 1.1.6. Starting of systems and equipment.
- 1.1.7. Demonstration and instruction of Whitefield Library personnel.
- 1.1.8. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.
- 1.1.9. General requirements for maintenance service.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 01 30 00 - Administrative Requirements: Submittals procedures.
- 1.2.2. Section 01 40 00 - Quality Requirements: Testing and inspection procedures.
- 1.2.3. Section 01 50 00 - Temporary Facilities and Controls: Temporary exterior enclosures.
- 1.2.4. Section 01 50 00 - Temporary Facilities and Controls: Temporary interior partitions.
- 1.2.5. Section 01 51 00 - Temporary Utilities: Temporary heating, cooling, and ventilating facilities.
- 1.2.6. Section 01 78 00 - Closeout Submittals: Project record documents, operation and maintenance data, warranties, and bonds.
- 1.2.7. Section 01 79 00 - Demonstration and Training: Demonstration of products and systems to be commissioned and where indicated in specific specification sections
- 1.2.8. Section 02 41 00 - Demolition: Demolition of whole structures and parts thereof; site utility demolition.

1.3. REFERENCE STANDARDS

- 1.3.1. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2022, with Errata (2021).

1.4. QUALIFICATIONS

- 1.4.1. For surveying work, employ a land surveyor registered in the State in which the Project is located and acceptable to Alba Architects. Submit evidence of surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate. Employ only individual(s) trained and experienced in collecting and recording accurate data relevant to ongoing construction activities,

1.5. COORDINATION

- 1.5.1. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- 1.5.2. Notify affected utility companies and comply with their requirements.

- 1.5.3. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- 1.5.4. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- 1.5.5. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- 1.5.6. Coordinate completion and clean-up of work of separate sections.
- 1.5.7. After Whitefield Library occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Whitefield Library's activities.

2. PART 2 PRODUCTS

2.1. PATCHING MATERIALS

- 2.1.1. New Materials: As specified in product sections; match existing products and work for patching and extending work.
- 2.1.2. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.
- 2.1.3. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 60 00 - Product Requirements.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
- 3.1.2. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
- 3.1.3. Examine and verify specific conditions described in individual specification sections.
- 3.1.4. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.
- 3.1.5. Verify that utility services are available, of the correct characteristics, and in the correct locations.
- 3.1.6. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.2. PREPARATION

- 3.2.1. Clean substrate surfaces prior to applying next material or substance.
- 3.2.2. Seal cracks or openings of substrate prior to applying next material or substance.
- 3.2.3. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.3. LAYING OUT THE WORK

- 3.3.1. Verify locations of survey control points prior to starting work.

- 3.3.2. Promptly notify Alba Architects of any discrepancies discovered.
- 3.3.3. Contractor shall locate and protect survey control and reference points.
- 3.3.4. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
- 3.3.5. Promptly report to Alba Architects the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
- 3.3.6. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Alba Architects.
- 3.3.7. Utilize recognized engineering survey practices.
- 3.3.8. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
 - 3.3.8.1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations; and _____.
 - 3.3.8.2. Grid or axis for structures.
 - 3.3.8.3. Building foundation, column locations, ground floor elevations, and _____.
- 3.3.9. Periodically verify layouts by same means.
- 3.3.10. Maintain a complete and accurate log of control and survey work as it progresses.

3.4. GENERAL INSTALLATION REQUIREMENTS

- 3.4.1. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
- 3.4.2. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
- 3.4.3. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
- 3.4.4. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
- 3.4.5. Make neat transitions between different surfaces, maintaining texture and appearance.

3.5. ALTERATIONS

- 3.5.1. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
 - 3.5.1.1. Verify that construction and utility arrangements are as indicated.
 - 3.5.1.2. Report discrepancies to Alba Architects before disturbing existing installation.
 - 3.5.1.3. Beginning of alterations work constitutes acceptance of existing conditions.
- 3.5.2. Keep areas in which alterations are being conducted separated from other areas that are still occupied.
 - 3.5.2.1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01 50 00 in locations indicated on drawings.
- 3.5.3. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.
 - 3.5.3.1. Where openings in exterior enclosure exist, provide construction to make exterior enclosure weatherproof.
 - 3.5.3.2. Insulate existing ducts or pipes that are exposed to outdoor ambient temperatures by alterations work.
- 3.5.4. Remove existing work as indicated and as required to accomplish new work.
 - 3.5.4.1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.
 - 3.5.4.2. Remove items indicated on drawings.
 - 3.5.4.3. Relocate items indicated on drawings.

- 3.5.4.4. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
- 3.5.4.5. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.
- 3.5.5. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove, relocate, and extend existing systems to accommodate new construction.
 - 3.5.5.1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
 - 3.5.5.2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
 - 3.5.5.3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
 - A. Disable existing systems only to make switchovers and connections; minimize duration of outages.
 - B. Provide temporary connections as required to maintain existing systems in service.
 - 3.5.5.4. Verify that abandoned services serve only abandoned facilities.
 - 3.5.5.5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.
- 3.5.6. Protect existing work to remain.
 - 3.5.6.1. Prevent movement of structure; provide shoring and bracing if necessary.
 - 3.5.6.2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
 - 3.5.6.3. Repair adjacent construction and finishes damaged during removal work.
- 3.5.7. Adapt existing work to fit new work: Make as neat and smooth transition as possible.
 - 3.5.7.1. When existing finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Alba Architects.
 - 3.5.7.2. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.
 - 3.5.7.3. Where a change of plane of 1/4 inch or more occurs in existing work, submit recommendation for providing a smooth transition for Alba Architects review and request instructions.
 - 3.5.7.4. Trim existing wood doors as necessary to clear new floor finish. Refinish trim as required.
- 3.5.8. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.
- 3.5.9. Refinish existing surfaces as indicated:
 - 3.5.9.1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
 - 3.5.9.2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.
- 3.5.10. Clean existing systems and equipment.

- 3.5.11. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.
- 3.5.12. Do not begin new construction in alterations areas before demolition is complete.
- 3.5.13. Comply with all other applicable requirements of this section.

3.6. CUTTING AND PATCHING

- 3.6.1. Whenever possible, execute the work by methods that avoid cutting or patching.
- 3.6.2. See Alterations article above for additional requirements.
- 3.6.3. Perform whatever cutting and patching is necessary to:
 - 3.6.3.1. Complete the work.
 - 3.6.3.2. Fit products together to integrate with other work.
 - 3.6.3.3. Provide openings for penetration of mechanical, electrical, and other services.
 - 3.6.3.4. Match work that has been cut to adjacent work.
 - 3.6.3.5. Repair areas adjacent to cuts to required condition.
 - 3.6.3.6. Repair new work damaged by subsequent work.
 - 3.6.3.7. Remove samples of installed work for testing when requested.
 - 3.6.3.8. Remove and replace defective and non-complying work.
- 3.6.4. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
- 3.6.5. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
- 3.6.6. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
- 3.6.7. Restore work with new products in accordance with requirements of Contract Documents.
- 3.6.8. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- 3.6.9. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 84 00, to full thickness of the penetrated element.
- 3.6.10. Patching:
 - 3.6.10.1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
 - 3.6.10.2. Match color, texture, and appearance.
 - 3.6.10.3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.7. PROGRESS CLEANING

- 3.7.1. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- 3.7.2. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
- 3.7.3. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
- 3.7.4. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.8. PROTECTION OF INSTALLED WORK

- 3.8.1. Protect installed work from damage by construction operations.
-

- 3.8.2. Provide special protection where specified in individual specification sections.
- 3.8.3. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- 3.8.4. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- 3.8.5. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- 3.8.6. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- 3.8.7. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.9. SYSTEM STARTUP

- 3.9.1. Coordinate schedule for start-up of various equipment and systems.
- 3.9.2. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.
- 3.9.3. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- 3.9.4. Verify that wiring and support components for equipment are complete and tested.
- 3.9.5. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.
- 3.9.6. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.10. DEMONSTRATION AND INSTRUCTION

- 3.10.1. See Section 01 79 00 - Demonstration and Training.

3.11. ADJUSTING

- 3.11.1. Adjust operating products and equipment to ensure smooth and unhindered operation.
- 3.11.2. Testing, adjusting, and balancing HVAC systems: See Section 23 05 93 - Testing, Adjusting, and Balancing for HVAC.

3.12. FINAL CLEANING

- 3.12.1. Execute final cleaning prior to final project assessment.
- 3.12.2. Use cleaning materials that are nonhazardous.
- 3.12.3. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
- 3.12.4. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.
- 3.12.5. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
- 3.12.6. Clean filters of operating equipment.
- 3.12.7. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, and drainage systems.
- 3.12.8. Clean site; sweep paved areas, rake clean landscaped surfaces.
- 3.12.9. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.13. CLOSEOUT PROCEDURES

- 3.13.1. Make submittals that are required by governing or other authorities.
-

- 3.13.2. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.
- 3.13.3. Notify Alba Architects when work is considered ready for Alba Architects's Substantial Completion inspection.
- 3.13.4. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Alba Architects's Substantial Completion inspection.
- 3.13.5. Conduct Substantial Completion inspection and create Final Correction Punch List containing Alba Architects's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Alba Architects.
- 3.13.6. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Whitefield Library-occupied areas.
- 3.13.7. Notify Alba Architects when work is considered finally complete and ready for Alba Architects's Substantial Completion final inspection.
- 3.13.8. Complete items of work determined by Alba Architects listed in executed Certificate of Substantial Completion.

3.14. MAINTENANCE

- 3.14.1. Provide service and maintenance of components indicated in specification sections.
- 3.14.2. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.
- 3.14.3. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.
- 3.14.4. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.
- 3.14.5. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Whitefield Library.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 01 78 00

CLOSEOUT SUBMITTALS

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Project record documents.
- 1.1.2. Operation and maintenance data.
- 1.1.3. Materials transparency manual.
- 1.1.4. Warranties and bonds.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 01 30 00 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
- 1.2.2. Individual Product Sections: Specific requirements for operation and maintenance data.
- 1.2.3. Individual Product Sections: Warranties required for specific products or Work.

1.3. SUBMITTALS

- 1.3.1. Project Record Documents: Submit documents to Alba Architects with claim for final Application for Payment.
- 1.3.2. Operation and Maintenance Data:
 - 1.3.2.1. For equipment, or component parts of equipment put into service during construction and operated by Whitefield Library, submit completed documents within ten days after acceptance.
 - 1.3.2.2. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Alba Architects comments. Revise content of all document sets as required prior to final submission.
 - 1.3.2.3. Submit two sets of revised final documents in final form within 10 days after final inspection.
- 1.3.3. Materials Transparency Manual:
 - 1.3.3.1. Compile and submit a digital and a printed version of information disclosing materials content for interior finishes, furnishings (including workstations), built-in furniture. Meet IWBI (BS) requirements for format and content.
- 1.3.4. Warranties and Bonds:
 - 1.3.4.1. For equipment or component parts of equipment put into service during construction with Whitefield Library's permission, submit documents within 10 days after acceptance.
 - 1.3.4.2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
 - 1.3.4.3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

2. PART 2 PRODUCTS - NOT USED

3. PART 3 EXECUTION

3.1. PROJECT RECORD DOCUMENTS

- 3.1.1. Maintain on site one set of the following record documents; record actual revisions to the Work:
 - 3.1.1.1. Drawings.
 - 3.1.1.2. Specifications.
 - 3.1.1.3. Addenda.
 - 3.1.1.4. Change Orders and other modifications to the Contract.
 - 3.1.1.5. Reviewed shop drawings, product data, and samples.
 - 3.1.1.6. Manufacturer's instruction for assembly, installation, and adjusting.
- 3.1.2. Ensure entries are complete and accurate, enabling future reference by Whitefield Library.
- 3.1.3. Store record documents separate from documents used for construction.
- 3.1.4. Record information concurrent with construction progress.
- 3.1.5. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
 - 3.1.5.1. Manufacturer's name and product model and number.
 - 3.1.5.2. Product substitutions or alternates utilized.
 - 3.1.5.3. Changes made by Addenda and modifications.
- 3.1.6. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
 - 3.1.6.1. Field changes of dimension and detail.
 - 3.1.6.2. Details not on original Contract drawings.

3.2. OPERATION AND MAINTENANCE DATA

- 3.2.1. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
- 3.2.2. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- 3.2.3. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.
- 3.2.4. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.3. OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

- 3.3.1. For Each Product, Applied Material, and Finish:
 - 3.3.1.1. Product data, with catalog number, size, composition, and color and texture designations.
 - 3.3.1.2. Information for re-ordering custom manufactured products.
- 3.3.2. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.
- 3.3.3. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.4. OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

- 3.4.1. For Each Item of Equipment and Each System:
 - 3.4.1.1. Description of unit or system, and component parts.
 - 3.4.1.2. Identify function, normal operating characteristics, and limiting conditions.
 - 3.4.1.3. Include performance curves, with engineering data and tests.
 - 3.4.1.4. Complete nomenclature and model number of replaceable parts.
- 3.4.2. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.
- 3.4.3. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
- 3.4.4. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- 3.4.5. Include manufacturer's printed operation and maintenance instructions.
- 3.4.6. Include sequence of operation by controls manufacturer.
- 3.4.7. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- 3.4.8. Provide control diagrams by controls manufacturer as installed.

3.5. ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

- 3.5.1. Assemble operation and maintenance data into durable manuals for Whitefield Library's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.
- 3.5.2. Where systems involve more than one specification section, provide separate tabbed divider for each system.
- 3.5.3. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.
- 3.5.4. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
- 3.5.5. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Alba Architects, Consultants, Contractor and subcontractors, with names of responsible parties.
- 3.5.6. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.
- 3.5.7. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.
- 3.5.8. Text: Manufacturer's printed data, or typewritten data on 20 pound paper.
- 3.5.9. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

3.6. WARRANTIES AND BONDS

- 3.6.1. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Whitefield Library's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.

- 3.6.2. Verify that documents are in proper form, contain full information, and are notarized.
- 3.6.3. Co-execute submittals when required.
- 3.6.4. Retain warranties and bonds until time specified for submittal.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 01 79 00

DEMONSTRATION AND TRAINING

1. PART 1 GENERAL

1.1. SUMMARY

- 1.1.1. Demonstration of products and systems to be commissioned and where indicated in specific specification sections.
- 1.1.2. Training of Whitefield Library personnel in operation and maintenance is required for:
 - 1.1.2.1. All software-operated systems.
 - 1.1.2.2. HVAC systems and equipment.
 - 1.1.2.3. Plumbing equipment.
 - 1.1.2.4. Electrical systems and equipment.
 - 1.1.2.5. Conveying systems.
- 1.1.3. Training of Whitefield Library personnel in care, cleaning, maintenance, and repair is required for:
 - 1.1.3.1. Items specified in individual product Sections.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 01 78 00 - Closeout Submittals: Operation and maintenance manuals.

1.3. SUBMITTALS

- 1.3.1. See Section 01 30 00 - Administrative Requirements, for submittal procedures; except:
 - 1.3.1.1. Make all submittals specified in this section, and elsewhere where indicated for commissioning purposes, directly to the Commissioning Provider.
 - 1.3.1.2. Submit one copy to the Commissioning Provider, not to be returned.
 - 1.3.1.3. Make commissioning submittals on time schedule specified by Commissioning Provider.
 - 1.3.1.4. Submittals indicated as "Draft" are intended for the use of the Commissioning Provider in preparation of overall Training Plan; submit in editable .rtf or .docx electronic format unless otherwise approved.
- 1.3.2. Draft Training Plans: Whitefield Library will designate personnel to be trained; tailor training to needs and skill-level of attendees.
 - 1.3.2.1. Provide an overall schedule showing all training sessions.
 - 1.3.2.2. Include at least the following for each training session:
 - A. Identification, date, time, and duration.
 - B. Description of products and/or systems to be covered.
 - C. Name of firm and person conducting training; include qualifications.
 - D. Intended audience, such as job description.
 - E. Objectives of training and suggested methods of ensuring adequate training.
- 1.3.3. Training Manuals: Provide training manual for each attendee; allow for minimum of two attendees per training session.
 - 1.3.3.1. Include applicable portion of O&M manuals.
 - 1.3.3.2. Include copies of all hand-outs, slides, overheads, video presentations, etc., that are not included in O&M manuals.

1.4. QUALITY ASSURANCE

- 1.4.1. Instructor Qualifications: Familiar with design, operation, maintenance and troubleshooting of the relevant products and systems.
 - 1.4.1.1. Provide as instructors the most qualified trainer of those contractors and/or installers who actually supplied and installed the systems and equipment.
 - 1.4.1.2. Where a single person is not familiar with all aspects, provide specialists with necessary qualifications.

2. PART 2 PRODUCTS - NOT USED

3. PART 3 EXECUTION

3.1. DEMONSTRATION - GENERAL

- 3.1.1. Demonstrations conducted during system start-up do not qualify as demonstrations for the purposes of this section, unless approved in advance by Whitefield Library.
- 3.1.2. Demonstrations conducted during Functional Testing need not be repeated unless Whitefield Library personnel training is specified.
- 3.1.3. Demonstration may be combined with Whitefield Library personnel training if applicable.
- 3.1.4. Operating Equipment and Systems: Demonstrate operation in all modes, including start-up, shut-down, seasonal changeover, emergency conditions, and troubleshooting, and maintenance procedures, including scheduled and preventive maintenance.
 - 3.1.4.1. Perform demonstrations not less than two weeks prior to Substantial Completion.
 - 3.1.4.2. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- 3.1.5. Non-Operating Products: Demonstrate cleaning, scheduled and preventive maintenance, and repair procedures.
 - 3.1.5.1. Perform demonstrations not less than two weeks prior to Substantial Completion.

3.2. TRAINING - GENERAL

- 3.2.1. Conduct training on-site unless otherwise indicated.
- 3.2.2. Whitefield Library will provide classroom and seating at no cost to Contractor.
- 3.2.3. Do not start training until Functional Testing is complete, unless otherwise specified or approved by the Commissioning Provider.
- 3.2.4. Provide training in minimum two hour segments.
- 3.2.5. Training schedule will be subject to availability of Whitefield Library's personnel to be trained; re-schedule training sessions as required by Whitefield Library; once schedule has been approved by Whitefield Library failure to conduct sessions according to schedule will be cause for Whitefield Library to charge Contractor for personnel "show-up" time.
- 3.2.6. Review of Facility Policy on Operation and Maintenance Data: During training discuss:
 - 3.2.6.1. The location of the O&M manuals and procedures for use and preservation; backup copies.
 - 3.2.6.2. Typical contents and organization of all manuals, including explanatory information, system narratives, and product specific information.
 - 3.2.6.3. Typical uses of the O&M manuals.
- 3.2.7. Product- and System-Specific Training:
 - 3.2.7.1. Review the applicable O&M manuals.
 - 3.2.7.2. For systems, provide an overview of system operation, design parameters and constraints, and operational strategies.

- 3.2.7.3. Review instructions for proper operation in all modes, including start-up, shut-down, seasonal changeover and emergency procedures, and for maintenance, including preventative maintenance.
- 3.2.7.4. Provide hands-on training on all operational modes possible and preventive maintenance.
- 3.2.7.5. Emphasize safe and proper operating requirements; discuss relevant health and safety issues and emergency procedures.
- 3.2.7.6. Discuss common troubleshooting problems and solutions.
- 3.2.7.7. Discuss any peculiarities of equipment installation or operation.
- 3.2.7.8. Discuss warranties and guarantees, including procedures necessary to avoid voiding coverage.
- 3.2.7.9. Review recommended tools and spare parts inventory suggestions of manufacturers.
- 3.2.7.10. Review spare parts and tools required to be furnished by Contractor.
- 3.2.7.11. Review spare parts suppliers and sources and procurement procedures.
- 3.2.8. Be prepared to answer questions raised by training attendees; if unable to answer during training session, provide written response within three days.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 02 03 42

REMOVAL AND SALVAGE OF PERIOD CONSTRUCTION MATERIALS

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Specified procedures required for preservation, rehabilitation, restoration, and reconstruction treatment areas.
- 1.1.2. Historic items and materials are indicated on drawings.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 01 35 91 - Period Treatment Procedures for general historic preservation project requirements.
- 1.2.2. Section 02 41 00 - Demolition: Selective demolition of nonhistoric, built site elements.

1.3. DEFINITIONS

- 1.3.1. Debris: Nonhistoric building materials and contents destroyed during demolition.
- 1.3.2. Deconstruction: Systematic dismantling and removal of a structure or its parts and salvage of elements and components for reuse, recycling, and retaining maximum value.

1.4. REFERENCE STANDARDS

- 1.4.1. 29 CFR 1926 - Safety and Health Regulations for Construction; Current Edition.
- 1.4.2. ASTM E336 - Standard Test Method for Measurement of Airborne Sound Attenuation Between Rooms in Buildings; 2025.
- 1.4.3. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2022, with Errata (2021).

1.5. FIELD CONDITIONS

- 1.5.1. Comply with applicable requirements of NFPA 241.
 - 1.5.2. Dust Control: Control dust resulting from removal, salvage, and demolition operations from spreading to occupied portions of the project and creating a nuisance in surrounding area. Use of water to control dust is not permitted when it will result in or create:
 - 1.5.2.1. Damage to existing building materials.
 - 1.5.2.2. Hazardous or objectionable conditions such as ice, flooding, or pollution.
 - 1.5.3. Protection of Existing Historic Property: Before beginning removal, salvage, or demolition work, survey the site and examine the drawings and specifications to determine the extent of the work. Take necessary precautions to avoid damage to existing items to remain in place, be reused, or remain Whitefield Library's property. Repair or restore to original condition items damaged by Contractor, using approved means, methods, and techniques. Replace items that cannot be successfully repaired or restored to original condition.
 - 1.5.4. Store materials to be salvaged or recycled daily, out of contact with the ground, under weathertight covering, in areas designated by Whitefield Library, and in the manner direct by Whitefield Library.
 - 1.5.5. Hazardous Materials: Comply with 29 CFR 1926 and state and local regulations.
-

2. PART 2 PRODUCTS (NOT USED)

3. PART 3 EXECUTION

3.1. PERIOD TREATMENT, GENERAL

- 3.1.1. See Section 01 35 91 for special procedure requirements related to elements and features of historical significance and value.

3.2. GENERAL PROCEDURES

- 3.2.1. Drawings indicating existing construction, building services, and site utilities are based on casual field observation and existing record documents only.
 - 3.2.1.1. Verify that construction, building services, and site utilities arrangements are as indicated.
 - 3.2.1.2. Report discrepancies to Alba Architects before disturbing existing historic elements.
 - 3.2.1.3. Beginning of work constitutes acceptance of existing conditions that are apparent upon examination at that time.
- 3.2.2. Separate spaces in which removals and salvage operations are conducted from occupied spaces.
 - 3.2.2.1. Provide, erect, and maintain temporary dustproof partitions; see Section 01 50 00.
- 3.2.3. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; exercise care to prevent water and humidity damage.
- 3.2.4. See Section 02 41 00 for selective demolition of nonhistoric elements.

3.3. ENVIRONMENTAL CONTROLS

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

3.4. ITEMS TO BE SALVAGED

- 3.4.1. General: Salvage elements and components to the maximum extent possible. Maintain a chain of custody of salvaged materials, including the condition of such materials before and after salvage operations.
 - 3.4.1.1. Remove furnishings, equipment, and materials not scheduled for salvage or recycling prior to initiating salvaging procedures.
 - 3.4.1.2. Remove historic items to be salvaged from the structure prior to deconstruction work.
 - 3.4.1.3. Accomplish removal of salvageable items by hand labor to the maximum extent possible.
 - 3.4.1.4. Take care not to damage historic portions of the structure scheduled to remain or items identified for salvage.

3.5. MATERIALS TO BE REMOVED

- 3.5.1. Remove existing nonhistoric elements as indicated and as required to allow direct access to period construction elements indicated to be restored or salvaged for reuse.
 - 3.5.1.1. Remove nonhistoric finishes.
 - 3.5.1.2. Remove items indicated on drawings.
- 3.5.2. Services: Remove existing systems and equipment to extent indicated, including but not limited to Fire Protection, Plumbing, HVAC, Electrical, and Telecommunications elements:
 - 3.5.2.1. Maintain existing active systems that are to remain in operation; maintain access to equipment and other operational components.

- 3.5.2.2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service switchover.
- 3.5.2.3. Verify that abandoned services serve only abandoned facilities prior to commencing removals.
- 3.5.2.4. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stubs and tag with identification.
- 3.5.3. Protect existing historic elements.
 - 3.5.3.1. Prevent movement of structure; provide temporary, removable shoring and bracing if necessary.
 - 3.5.3.2. Perform cutting to accomplish removals neatly, minimizing overcutting.

3.6. MATERIALS TO BE RECYCLED

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

3.7. CLEANING

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

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 02 41 00 DEMOLITION

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Selective demolition of building elements for alteration purposes.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 01 10 00 - Summary: Limitations on Contractor's use of site and premises.
- 1.2.2. Section 01 10 00 - Summary: Sequencing and staging requirements.
- 1.2.3. Section 01 10 00 - Summary: Description of items to be salvaged or removed for re-use by Contractor.
- 1.2.4. Section 01 50 00 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.
- 1.2.5. Section 01 60 00 - Product Requirements: Handling and storage of items removed for salvage and relocation.
- 1.2.6. Section 01 70 00 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.
- 1.2.7. Section 02 03 42 - Removal and Salvage of Period Construction Materials.
- 1.2.8. Section 31 22 00 - Grading: Rough and fine grading.
- 1.2.9. Section 31 23 23 - Fill: Fill material for filling holes, pits, and excavations generated as a result of removal operations.

1.3. DEFINITIONS

- 1.3.1. Demolish: Dismantle, raze, destroy, or wreck any building or structure or any part thereof.
- 1.3.2. Remove: Detach or dismantle items from existing construction and dispose of them off site, unless items are indicated to be salvaged or reinstalled.
- 1.3.3. Remove and Salvage: Detach or dismantle items from existing construction in a manner to prevent damage. Clean, package, label and deliver salvaged items to Whitefield Library in ready-for-reuse condition.
- 1.3.4. Remove and Reinstall: Detach or dismantle items from existing construction in a manner to prevent damage. Clean and prepare for reuse and reinstall where indicated.
- 1.3.5. Existing to Remain: Designation for existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

1.4. REFERENCE STANDARDS

- 1.4.1. 29 CFR 1926 - Safety and Health Regulations for Construction; Current Edition.
- 1.4.2. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2022, with Errata (2021).

2. PART 3 EXECUTION

2.1. DEMOLITION

- 2.1.1. Remove portions of existing building as identified on the drawings and necessary for renovations.
- 2.1.2. Remove other items indicated, for salvage, relocation, and recycling.
- 2.1.3. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as specified in Section 31 22 00.

2.2. GENERAL PROCEDURES AND PROJECT CONDITIONS

- 2.2.1. Comply with requirements in Section 01 70 00.
- 2.2.2. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
 - 2.2.2.1. Obtain required permits.
 - 2.2.2.2. Comply with applicable requirements of NFPA 241.
 - 2.2.2.3. Use of explosives is not permitted.
 - 2.2.2.4. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
 - 2.2.2.5. Provide, erect, and maintain temporary barriers and security devices.
 - 2.2.2.6. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
 - 2.2.2.7. Do not close or obstruct roadways or sidewalks without permits from authority having jurisdiction.
 - 2.2.2.8. Conduct operations to minimize obstruction of public and private entrances and exits. Do not obstruct required exits at any time. Protect persons using entrances and exits from removal operations.
 - 2.2.2.9. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon, or limit access to their property.
- 2.2.3. Do not begin removal until receipt of notification to proceed from Whitefield Library.
- 2.2.4. Protect existing structures and other elements to remain in place and not removed.
 - 2.2.4.1. Provide bracing and shoring.
 - 2.2.4.2. Prevent movement or settlement of adjacent structures.
 - 2.2.4.3. Stop work immediately if adjacent structures appear to be in danger.
- 2.2.5. Minimize production of dust due to demolition operations. Do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.
- 2.2.6. Hazardous Materials:
 - 2.2.6.1. If hazardous materials are discovered during removal operations, stop work and notify Alba Architects and Whitefield Library; hazardous materials include regulated asbestos containing materials, lead, PCBs, and mercury.

2.3. EXISTING UTILITIES

- 2.3.1. Coordinate work with utility companies. Notify utilities before starting work, comply with their requirements, and obtain required permits.
- 2.3.2. Protect existing utilities to remain from damage.
- 2.3.3. Do not disrupt public utilities without permit from authority having jurisdiction.
- 2.3.4. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Whitefield Library.
- 2.3.5. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Whitefield Library.

- 2.3.6. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.
- 2.3.7. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

2.4. SELECTIVE DEMOLITION FOR ALTERATIONS

- 2.4.1. Existing construction and utilities indicated on drawings are based on casual field observation and existing record documents only.
 - 2.4.1.1. Verify construction and utility arrangements are as indicated.
 - 2.4.1.2. Report discrepancies to Alba Architects before disturbing existing installation.
 - 2.4.1.3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.
- 2.4.2. Separate areas in which demolition is being conducted from areas that remain occupied.
 - 2.4.2.1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01 50 00 .
- 2.4.3. Maintain weatherproof exterior building enclosure, except for interruptions required for replacement or modifications; prevent water and humidity damage.
- 2.4.4. Remove existing work as indicated and required to accomplish new work.
 - 2.4.4.1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction indicated.
 - 2.4.4.2. Remove items indicated on drawings.
- 2.4.5. Services including, but not limited to, HVAC, Plumbing, Electrical, and Telecommunications: Remove existing systems and equipment as indicated.
 - 2.4.5.1. Maintain existing active systems to remain in operation, and maintain access to equipment and operational components.
 - 2.4.5.2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
 - 2.4.5.3. Verify that abandoned services serve only abandoned facilities before removal.
 - 2.4.5.4. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings. Remove back to source of supply where possible, otherwise cap stub and tag with identification.
- 2.4.6. Protect existing work to remain.
 - 2.4.6.1. Prevent movement of structure. Provide shoring and bracing as required.
 - 2.4.6.2. Perform cutting to accomplish removal work neatly and as specified for cutting new work.
 - 2.4.6.3. Repair adjacent construction and finishes damaged during removal work.
 - 2.4.6.4. Patch to match new work.

2.5. DEBRIS AND WASTE REMOVAL

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

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Concrete formwork.
- 1.1.2. Floors and slabs on grade.
- 1.1.3. Concrete foundation walls.
- 1.1.4. Concrete reinforcement.
- 1.1.5. Joint devices associated with concrete work.
- 1.1.6. Concrete curing.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 03 35 11 - Concrete Floor Finishes: Densifiers, hardeners, applied coatings, and polishing.
- 1.2.2. Section 07 92 00 - Joint Sealants: Products and installation for sealants and joint fillers for saw cut joints and isolation joints in slabs.

1.3. REFERENCE STANDARDS

- 1.3.1. ACI PRC-213 - Guide for Structural Lightweight-Aggregate Concrete; 2014 (Reapproved 2023).
- 1.3.2. ACI CODE-318 - Building Code Requirements for Structural Concrete and Commentary; 2019 (Reapproved 2022).
- 1.3.3. ACI PRC-211.1 - Selecting Proportions for Normal-Density and High Density-Concrete - Guide; 2022.
- 1.3.4. ACI PRC-223 - Shrinkage-Compensating Concrete - Guide; 2021.
- 1.3.5. ACI PRC-302.1 - Guide to Concrete Floor and Slab Construction; 2015.
- 1.3.6. ACI PRC-304 - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000 (Reapproved 2009).
- 1.3.7. ACI PRC-305 - Guide to Hot Weather Concreting; 2020.
- 1.3.8. ACI PRC-306 - Guide to Cold Weather Concreting; 2016.
- 1.3.9. ACI PRC-308 - Guide to External Curing of Concrete; 2016.
- 1.3.10. ACI PRC-347 - Guide to Formwork for Concrete; 2014 (Reapproved 2021).
- 1.3.11. ACI SPEC-117 - Specification for Tolerances for Concrete Construction and Materials; 2010 (Reapproved 2015).
- 1.3.12. ACI SPEC-301 - Specifications for Concrete Construction; 2020.
- 1.3.13. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2025.
- 1.3.14. ASTM A884/A884M - Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement; 2025.
- 1.3.15. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2024.
- 1.3.16. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2024a.
- 1.3.17. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2024.
- 1.3.18. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2020.
- 1.3.19. ASTM C150/C150M - Standard Specification for Portland Cement; 2024.

- 1.3.20. ASTM C881/C881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete; 2020a.
- 1.3.21. ASTM C989/C989M - Standard Specification for Slag Cement for Use in Concrete and Mortars; 2025.
- 1.3.22. ASTM C1059/C1059M - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete; 2024.
- 1.3.23. ASTM E1155/E1155M - Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers; 2023.
- 1.3.24. ASTM E1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs; 2024.
- 1.3.25. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2017 (Reapproved 2023).

1.4. SUBMITTALS

- 1.4.1. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- 1.4.2. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.
- 1.4.3. Mix Design: Submit proposed concrete mix design.
 - 1.4.3.1. Indicate proposed mix design complies with requirements of ACI SPEC-301, Section 4 - Concrete Mixtures.
 - 1.4.3.2. Indicate proposed mix design complies with requirements of ACI CODE-318, Chapter 5 - Concrete Quality, Mixing and Placing.
- 1.4.4. Test Reports: Submit report for each test or series of tests specified.
- 1.4.5. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

1.5. QUALITY ASSURANCE

- 1.5.1. Perform work of this section in accordance with ACI SPEC-301 and ACI CODE-318.
- 1.5.2. Follow recommendations of ACI PRC-305 when concreting during hot weather.
- 1.5.3. Follow recommendations of ACI PRC-306 when concreting during cold weather.

1.6. WARRANTY

- 1.6.1. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

2. PART 2 PRODUCTS

2.1. FORMWORK

- 2.1.1. Formwork Design and Construction: Comply with guidelines of ACI PRC-347 to provide formwork that will produce concrete complying with tolerances of ACI SPEC-117.
- 2.1.2. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.
 - 2.1.2.1. Form Facing for Exposed Finish Concrete: Contractor's choice of materials that will provide smooth, stain-free final appearance.
 - 2.1.2.2. Earth Cuts: Do not use earth cuts as forms for vertical surfaces. Natural rock formations that maintain a stable vertical edge may be used as side forms.
 - 2.1.2.3. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.
 - 2.1.2.4. Form Ties: Cone snap type that will leave no metal within 1-1/2 inches of concrete surface.

2.2. REINFORCEMENT MATERIALS

2.2.1. See Structural Drawings and Specifications.

2.3. CONCRETE MATERIALS

2.3.1. See Structural Drawings and Specifications.

2.4. ADMIXTURES

2.4.1. See Structural Drawings and Specifications.

2.5. ACCESSORY MATERIALS

2.5.1. Underslab Vapor Retarder:

2.5.1.1. Sheet Material: ASTM E1745, Class A; stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs. Single-ply polyethylene is prohibited.

2.5.1.2. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations.

2.5.1.3. Products:

A. Stego Industries, LLC: www.stegoindustries.com/#sle.

B. Any product as equal and approved.

C. Substitutions: See Section 01 60 00 - Product Requirements.

2.6. BONDING AND JOINTING PRODUCTS

2.6.1. See Structural Drawings and Specifications.

2.6.2. Latex Bonding Agent: Non-redispersable acrylic latex, complying with ASTM C1059/C1059M, Type II.

2.6.3. Epoxy Bonding System:

2.7. CURING MATERIALS

2.7.1. See Structural Drawings and Specifications.

2.8. CONCRETE MIX DESIGN

2.8.1. See Structural Drawings and Specifications.

3. PART 3 EXECUTION

3.1. EXAMINATION

3.1.1. Verify lines, levels, and dimensions before proceeding with work of this section.

3.2. PREPARATION

3.2.1. Formwork: Comply with requirements of ACI SPEC-301. Design and fabricate forms to support all applied loads until concrete is cured and for easy removal without damage to concrete.

3.2.2. Verify that forms are clean and free of rust before applying release agent.

3.2.3. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.

3.2.4. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning and applying bonding agent in according to bonding agent manufacturer's instructions.

- 3.2.4.1. Use epoxy bonding system for bonding to damp surfaces, for structural load-bearing applications, and where curing under humid conditions is required.
- 3.2.4.2. Use latex bonding agent only for non-load-bearing applications.
- 3.2.5. Where new concrete with integral waterproofing is to be bonded to previously placed concrete, prepare surfaces to be treated in accordance with waterproofing manufacturer's instructions. Saturate cold joint surface with clean water, and remove excess water before application of coat of waterproofing admixture slurry. Apply slurry coat uniformly with semi-stiff bristle brush at rate recommended by waterproofing manufacturer.
- 3.2.6. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.
- 3.2.7. Interior Slabs on Grade: Install vapor retarder under interior slabs on grade. Comply with ASTM E1643. Lap joints minimum 6 inches. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions. Repair damaged vapor retarder before covering.

3.3. INSTALLING REINFORCEMENT AND OTHER EMBEDDED ITEMS

- 3.3.1. Comply with requirements of ACI SPEC-301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.
- 3.3.2. Install welded wire reinforcement in maximum possible lengths, and offset end laps in both directions. Splice laps with tie wire.
- 3.3.3. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with concrete placement.

3.4. PLACING CONCRETE

- 3.4.1. Place concrete in accordance with ACI PRC-304.
- 3.4.2. Place concrete for floor slabs in accordance with ACI PRC-302.1.
- 3.4.3. Place concrete with shrinkage-compensating expansive component in accordance with ACI PRC-223.
- 3.4.4. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- 3.4.5. Ensure reinforcement, inserts, waterstops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.
- 3.4.6. Place concrete continuously without construction (cold) joints wherever possible; where construction joints are necessary, before next placement prepare joint surface by removing laitance and exposing the sand and sound surface mortar, by sandblasting or high-pressure water jetting.
- 3.4.7. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

3.5. SLAB JOINTING

- 3.5.1. Locate joints as indicated on drawings.
- 3.5.2. Anchor joint fillers and devices to prevent movement during concrete placement.
- 3.5.3. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab.
- 3.5.4. Load Transfer Construction and Contraction Joints: Install load transfer devices as indicated; saw cut joint at surface as indicated for contraction joints.
- 3.5.5. Saw Cut Contraction Joints: Saw cut joints before concrete begins to cool, within 4 to 12 hours after placing; use 3/16 inch thick blade and cut at least 1 inch deep but not less than one quarter (1/4) the depth of the slab.

- 3.5.6. Construction Joints: Where not otherwise indicated, use metal combination screed and key form, with removable top section for joint sealant.

3.6. FLOOR FLATNESS AND LEVELNESS TOLERANCES

- 3.6.1. Maximum Variation of Surface Flatness:
 - 3.6.1.1. Exposed Concrete Floors: 1/4 inch in 10 feet.
 - 3.6.1.2. Under Seamless Resilient Flooring: 1/4 inch in 10 feet.
 - 3.6.1.3. Under Carpeting: 1/4 inch in 10 feet.
- 3.6.2. Correct the slab surface if tolerances are less than specified.
- 3.6.3. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

3.7. CONCRETE FINISHING

- 3.7.1. Repair surface defects, including tie holes, immediately after removing formwork.
- 3.7.2. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.
- 3.7.3. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Provide finish as follows:
 - 3.7.3.1. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive, not more than 24 hours after form removal.
- 3.7.4. Concrete Slabs: Finish to requirements of ACI PRC-302.1 and as follows:
 - 3.7.4.1. Surfaces to Receive Thick Floor Coverings: "Wood float" as described in ACI PRC-302.1; thick floor coverings include quarry tile, ceramic tile, and Portland cement terrazzo with full bed setting system.
 - 3.7.4.2. Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI PRC-302.1; thin floor coverings include carpeting, resilient flooring, seamless flooring, resinous matrix terrazzo, thin set quarry tile, and thin set ceramic tile.
 - 3.7.4.3. Decorative Exposed Surfaces: Trowel as described in ACI PRC-302.1; take measures necessary to avoid black-burnish marks; decorative exposed surfaces include surfaces to be stained or dyed, pigmented concrete, surfaces to receive liquid hardeners, surfaces to receive dry-shake hardeners, surfaces to be polished, and all other exposed slab surfaces.
- 3.7.5. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1:100 nominal.

3.8. CURING AND PROTECTION

- 3.8.1. Comply with requirements of ACI PRC-308. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- 3.8.2. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
 - 3.8.2.1. Normal concrete: Not less than seven days.
 - 3.8.2.2. High early strength concrete: Not less than four days.
- 3.8.3. Formed Surfaces: Cure by moist curing with forms in place for full curing period.
- 3.8.4. Surfaces Not in Contact with Forms:
 - 3.8.4.1. Slabs and Floors To Receive Adhesive-Applied Flooring: Curing compounds and other surface coatings are usually considered unacceptable by flooring and adhesive manufacturers. If such materials must be used, either obtain the approval of the flooring and adhesive manufacturers prior to use or remove the surface coating after curing to flooring manufacturer's satisfaction.

- 3.8.4.2. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.
- 3.8.4.3. Final Curing: Begin after initial curing but before surface is dry.

3.9. FIELD QUALITY CONTROL

- 3.9.1. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00 - Quality Requirements.
- 3.9.2. Provide free access to concrete operations at project site and cooperate with appointed firm.
- 3.9.3. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.
- 3.9.4. Tests of concrete and concrete materials may be performed at any time to ensure compliance with specified requirements.
- 3.9.5. Compressive Strength Tests: ASTM C39/C39M, for each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cubic yards or less of each class of concrete placed.
- 3.9.6. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.
- 3.9.7. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C143/C143M.

3.10. DEFECTIVE CONCRETE

- 3.10.1. Test Results: The testing agency shall report test results in writing to Alba Architects and Contractor within 24 hours of test.
- 3.10.2. Defective Concrete: Concrete not complying with required lines, details, dimensions, tolerances or specified requirements.
- 3.10.3. Repair or replacement of defective concrete will be determined by the Alba Architects. The cost of additional testing shall be borne by Contractor when defective concrete is identified.
- 3.10.4. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Alba Architects for each individual area.

3.11. PROTECTION

- 3.11.1. Do not permit traffic over unprotected concrete floor surface until fully cured.

3.12. SCHEDULE - CONCRETE TYPES AND FINISHES

- 3.12.1. See Structural Drawings & Specifications

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 04 03 00

CONSERVATION TREATMENT FOR PERIOD MASONRY

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Cleaning of existing masonry surfaces.
- 1.1.2. Replacement of existing masonry units.
- 1.1.3. Repair of damaged existing masonry.
- 1.1.4. Raking and repointing of existing mortar joints.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 01 35 91 - Period Treatment Procedures for general historic preservation project requirements.

1.3. ABBREVIATIONS AND ACRONYMS

- 1.3.1. NPS: National Park Service, part of U.S. Department of the Interior.
- 1.3.2. TPS: Technical Preservation Services, part of National Park Service.

1.4. DEFINITIONS

- 1.4.1. Aggregates: Sand component of mortar.
- 1.4.2. Biocide: Chemical treatment that inhibits, deters, or controls organic growth typically removed by cleaning following biocide treatment.
- 1.4.3. Binder: Component of mortar that binds aggregate particles into a cohesive material.
- 1.4.4. Dispersed Lime Crack Injection: Repair method in which dispersed lime material is injected using a needle or syringe into small cracks ranging in width from hairline to 1/8 inch.
- 1.4.5. Consolidant: Chemical product to strengthen loose or deteriorated stone.
- 1.4.6. Dutchman: Repair method to partially remove deteriorated portion of stone and replace with salvaged or new stone.
- 1.4.7. In situ: Masonry units and mortar remain in place and are restored without removal.
- 1.4.8. Lime Wash: Protective surface treatment comprised of calcium hydroxide particles in suspension in water, along with small amounts of calcium carbonate, silica particles, and other minerals.
- 1.4.9. New Elements: New, nonhistoric materials added to masonry structures to aid in resistance to structural loads or water infiltration.
- 1.4.10. Patching: Use of substitute repair materials to treat damaged or deteriorated masonry units in situ.
- 1.4.11. Repointing: Removal of existing mortar joints to specified depth and replacement with mortar matching color, texture, and performance of original mortar, and with water vapor transmission, bond, hardness, and flexibility compatible with original mortar, tested in accordance with ASTM C1713.
- 1.4.12. Retooling: Chisel is used to recreate surrounding stone texture finish.
- 1.4.13. Surface Treatment: Application of traditional materials or contemporary chemical products to surface of masonry to provide protection to the masonry and mortar or reduce water infiltration.
- 1.4.14. Wall System: Masonry structures comprised of different materials but functioning holistically; restoration and cleaning processes should take into account effects on the adjacent materials and the building as a whole.

- 1.4.15. Saturated Surface Dry (SSD): Condition of masonry after application of water to soak into the capillary pores of the masonry, saturating an area of the masonry, reducing further suction, and allowing surface water to evaporate, leaving the substrate damp but without a surface film of water.

1.5. REFERENCE STANDARDS

- 1.5.1. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2022, with Errata (2024).
- 1.5.1. ACI CODE-318 - Building Code Requirements for Structural Concrete and Commentary; 2019 (Reapproved 2022).
- 1.5.2. ASTM C34 - Standard Specification for Structural Clay Loadbearing Wall Tile; 2023.
- 1.5.3. ASTM C56 - Standard Specification for Structural Clay Nonloadbearing Tile; 2022.
- 1.5.4. ASTM C67/C67M - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile; 2023.
- 1.5.5. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 50 mm [2 in.] Cube Specimens); 2024.
- 1.5.6. ASTM C119 - Standard Terminology Relating to Dimension Stone; 2024.
- 1.5.7. ASTM C126 - Standard Specification for Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units; 2022.
- 1.5.8. ASTM C141/C141M - Standard Specification for Hydrated Hydraulic Lime for Structural Purposes; 2014.
- 1.5.9. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2025.
- 1.5.10. ASTM C150/C150M - Standard Specification for Portland Cement; 2024.
- 1.5.11. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2024.
- 1.5.12. ASTM C212 - Standard Specification for Structural Clay Facing Tile; 2022.
- 1.5.13. ASTM C216 - Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale); 2024.
- 1.5.14. ASTM C315 - Standard Specification for Clay Flue Liners and Chimney Pots; 2007 (Reapproved 2021).
- 1.5.15. ASTM C503/C503M - Standard Specification for Marble Dimension Stone; 2023.
- 1.5.16. ASTM C530 - Standard Specification for Structural Clay Nonloadbearing Screen Tile; 2023.
- 1.5.17. ASTM C568/C568M - Standard Specification for Limestone Dimension Stone; 2022.
- 1.5.18. ASTM C615/C615M - Standard Specification for Granite Dimension Stone; 2023.
- 1.5.19. ASTM C616/C616M - Standard Specification for Quartz-Based Dimension Stone; 2022.
- 1.5.20. ASTM C881/C881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete; 2020a.
- 1.5.21. ASTM C1364 - Standard Specification for Architectural Cast Stone; 2025.
- 1.5.22. ASTM C1528/C1528M - Standard Guide for Selection of Dimension Stone; 2020, with Editorial Revision (2025).
- 1.5.23. ASTM C1713 - Standard Specification for Mortars for the Repair of Historic Masonry; 2023.
- 1.5.24. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2016 (Reapproved 2021).
- 1.5.25. ASTM D570 - Standard Test Method for Water Absorption of Plastics; 2022.
- 1.5.26. ASTM D638 - Standard Test Method for Tensile Properties of Plastics; 2022.
- 1.5.27. ASTM D695 - Standard Test Method for Compressive Properties of Rigid Plastics; 2023.
- 1.5.28. ASTM D790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials; 2017.
- 1.5.29. ASTM D905 - Standard Test Method for Strength Properties of Adhesive Bonds in Shear by Compression Loading; 2008 (Reapproved 2021).
- 1.5.30. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness; 2015 (Reapproved 2021).

- 1.5.31. ILI (HB) - Indiana Limestone Handbook; 2007.
- 1.5.32. NPS (THP) - The Secretary of The Interior's Standards For the Treatment of Historic Properties with Guidelines For Preserving, Rehabilitating, Restoring & Reconstructing Historic Buildings; 2017.

1.6. SUBMITTALS

- 1.6.1. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- 1.6.2. Product Data: Provide data on cleaning compounds.

1.7. QUALITY ASSURANCE

- 1.7.1. Comply with provisions of TMS 402/602, except where exceeded by requirements of Contract Documents.
- 1.7.2. Mortar Testing Agency Qualifications: Independent firm specializing in performing analysis of historic masonry mortar.

1.8. DELIVERY, STORAGE, AND HANDLING

- 1.8.1. Deliver masonry neatly stacked and tied on pallets. Store clear of ground with adequate waterproof covering.

1.9. FIELD CONDITIONS

- 1.9.1. Cold and Hot Weather Requirements for Masonry Work: Comply with requirements of TMS 402/602.

2. PART 2 PRODUCTS

2.1. CLEANING MATERIALS

- 2.1.1. Cleaning Agent: Detergent type.
- 2.1.2. Cleaning Agent: 0.5 lb of sodium hydrosulfite mixture to one gallon of water.
- 2.1.3. Poultice Materials: Commercially available or custom-prepared materials that adhere to and peel off paint or other coatings without damaging underlying masonry,
 - 2.1.3.1. Manufacturers:
 - A. American Building Restoration Products, Inc: www.abrp.com/#sle.
 - B. Diedrich Technologies, Inc: www.diedrichtechnologies.com/#sle.
 - C. HMK Stone Care System: www.hmkstonecare.com/#sle.
 - D. PROSOCO: www.prosoco.com/#sle.
 - E. Substitutions: See Section 01 60 00 - Product Requirements.

2.2. MORTAR MATERIALS

- 2.2.1. To Match Existing
- 2.2.2. Sand: ASTM C144.
- 2.2.3. Mortar Mixing:
 - 2.2.3.1. General Requirements:
 - A. Do not use modern additives unless permitted in writing by Alba Architects.
 - B. Match the historic mortar in color, texture, and tooling.

2.3. MASONRY UNIT MATERIALS

- 2.3.1. Replacement Facing Brick: Match existing historic brick color, shape, size, texture, and general appearance.

- 2.3.2. Replacement Stone: Match existing historic stone elements' grade, type, color, shape, size, texture, finish profile, and general appearance.

2.4. PAINT REMOVERS

- 2.4.1. Manufacturers:
 - 2.4.1.1. American Building Restoration Products, Inc: www.abrp.com/#sle.
 - 2.4.1.2. Dumond Chemicals, Inc: www.dumondchemicals.com/#sle.
 - 2.4.1.3. PROSOCO, Inc: www.prosoco.com/#sle.
 - 2.4.1.4. Substitutions: See Section 01 60 00 - Product Requirements.

3. PART 3 EXECUTION

3.1. PERIOD TREATMENT, GENERAL

- 3.1.1. See Section 01 35 91 for special procedure requirements related to elements and features of historical significance and value.

3.2. EXAMINATION

- 3.2.1. Verify that surfaces to be cleaned and restored are ready for work of this section.

3.3. EVALUATION AND ASSESSMENT

- 3.3.1. Begin masonry work after evaluation and analysis of areas to be repaired are completed including, but not limited to, sampling and testing of the existing mortar to determine its composition and qualities.
- 3.3.2. Do not start repairs until conditions causing masonry deterioration have been identified.

3.4. PREPARATION

- 3.4.1. Protect other elements from damage that may result from restoration procedures.
- 3.4.2. Carefully remove and store identified items located in areas to be restored including, but not limited to, fixtures, fittings, finish hardware, and accessories; reinstall upon completion of restoration work.
- 3.4.3. Protect nonrestoration areas from restoration areas to prevent damage.
- 3.4.4. Mask or cover adjacent surfaces and permanent equipment. Secure coverings without using nails and without tape that leaves residue. Do not use impervious sheeting which produces condensation.
 - 3.4.4.1. Use materials that will withstand cleaning and restoration procedures.
- 3.4.5. Cover existing landscaping within work areas with tarpaulins or similar covers during work periods.
- 3.4.6. Separate adjacent occupied areas with dust proof and weatherproof partitions.
- 3.4.7. Protect roof membrane and flashings from damage with 1/2-inch plywood laid on roof surfaces over entire work area and traffic route.
- 3.4.8. When using liquid cleaning methods, provide drainage devices to prevent runoff over adjacent surfaces, unless those surfaces are impervious to damage from runoff.
- 3.4.9. Do not allow cleaning runoff to drain into sanitary or storm sewers.

3.5. PAINT REMOVAL

- 3.5.1. Remove existing coatings to bare substrate or first sound paint layer as indicated.
- 3.5.2. Removal with Chemical Products: Use products in accordance with manufacturer's instructions.

- 3.5.2.1. Allow product to dwell on existing surface as recommended by manufacturer or until existing coating shows signs of dissolving. Periodically agitate applied remover product with a stiff bristle brush to improve penetration into existing coating.
- 3.5.2.2. Ensure that chemicals and coating residue are removed from substrate.
- 3.5.3. Leave surfaces in clean, residue-free condition, ready for subsequent restoration procedures.

3.6. INSTALLATION

- 3.6.1. Do not mix or apply materials when the ambient temperature or humidity are outside of range recommended by their manufacturers.
- 3.6.2. Schedule conservation treatments to be carried out during appropriate environmental conditions to avoid weather-related failures.

3.7. MASONRY UNIT REPLACEMENT

- 3.7.1. Cut out damaged and deteriorated masonry to prevent damage to adjacent materials.
- 3.7.2. Support structure as necessary prior to cutting out units.
- 3.7.3. Cut away loose or unsound, adjoining masonry as directed.
- 3.7.4. Build in new units for new work as specified in other sections.
- 3.7.5. Mortar Mix: Color and proportion to match existing.
- 3.7.6. Ensure that anchors are correctly located and built in.
- 3.7.7. Install built-in masonry work to match and align with existing, with joints and coursing true and level, faces plumb and in line. Build-in all openings, accessories, and fittings.

3.8. REPOINTING

- 3.8.1. Cut out loose or disintegrated mortar in joints to minimum 1/2-inch depth or until sound mortar is reached.
- 3.8.2. Exercise appropriate caution to prevent damage to existing masonry.
- 3.8.3. When cutting is complete, remove dust and loose material with air jet.
- 3.8.4. Premoisten joints and apply pointing mortar. Pack tightly in maximum 1/4-inch layers. Form a smooth, compact concave joint to match existing.
- 3.8.5. Moist cure for 72 hours.

3.9. RESTORATION CLEANING

- 3.9.1. Preclean surfaces and remove large particles with wood scrapers or nonferrous wire brush.
- 3.9.2. Perform cleaning and rinsing of exterior masonry only during daylight hours.
- 3.9.3. Preparatory Exterior Masonry Cleaning: Use safe spray pressures for each type of item to be cleaned.

3.10. CLEANING

- 3.10.1. Remove stains, efflorescence, or other excess resulting from the work of this section. Do without delay to avoid penetration and setting.
- 3.10.2. Remove excess mortar, smears, and droppings as work proceeds and upon completion.
- 3.10.3. Clean surrounding surfaces.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 04 26 13

MASONRY VENEER

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Clay facing brick.
- 1.1.2. Mortar and grout.
- 1.1.3. Reinforcement and anchorage.
- 1.1.4. Flashings.
- 1.1.5. Accessories.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 06 10 00 - Rough Carpentry: Wood stud backup for masonry veneer.
- 1.2.2. Section 07 62 00 - Sheet Metal Flashing and Trim: Through-wall masonry flashings.
- 1.2.3. Section 07 92 00 - Joint Sealants: Sealing control and expansion joints.

1.3. REFERENCE STANDARDS

- 1.3.1. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
- 1.3.2. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications; 2025a.
- 1.3.3. ASTM A580/A580M - Standard Specification for Stainless Steel Wire; 2023.
- 1.3.4. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2025.
- 1.3.5. ASTM A951/A951M - Standard Specification for Steel Wire for Masonry Joint Reinforcement; 2022.
- 1.3.6. ASTM C67/C67M - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile; 2023.
- 1.3.7. ASTM C126 - Standard Specification for Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units; 2022.
- 1.3.8. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2025.
- 1.3.9. ASTM C150/C150M - Standard Specification for Portland Cement; 2024.
- 1.3.10. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2024.
- 1.3.11. ASTM C216 - Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale); 2024.
- 1.3.12. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2025a.
- 1.3.13. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2024.
- 1.3.14. ASTM C476 - Standard Specification for Grout for Masonry; 2023.
- 1.3.15. ASTM C1405 - Standard Specification for Glazed Brick (Single Fired, Brick Units); 2020a.
- 1.3.16. BIA Technical Notes No. 7 - Water Penetration Resistance – Design and Detailing; 2017.
- 1.3.17. BIA Technical Notes No. 46 - Maintenance of Brick Masonry; 2017.
- 1.3.18. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2022, with Errata (2024).
- 1.3.19. UL (FRD) - Fire Resistance Directory; Current Edition.

1.4. SUBMITTALS

- 1.4.1. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- 1.4.2. Product Data: Provide data for masonry units, fabricated wire reinforcement, and mortar.
- 1.4.3. Samples: Submit four samples of decorative block and facing brick units to illustrate color, texture, and extremes of color range.

1.5. QUALITY ASSURANCE

- 1.5.1. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section with minimum ten years of documented experience.
- 1.5.2. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years of documented experience.

1.6. DELIVERY, STORAGE, AND HANDLING

- 1.6.1. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

1.7. FIELD CONDITIONS

- 1.7.1. Cold and Hot Weather Requirements: Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.

2. PART 2 PRODUCTS

2.1. BRICK UNITS

- 2.1.1. Facing Brick: ASTM C216, Type FBS Smooth, Grade SW.
 - 2.1.1.1. Color and Texture: To Match Existing.
 - 2.1.1.2. Nominal Size: To Match Existing.

2.2. MORTAR AND GROUT MATERIALS

- 2.2.1. To Match Existing
- 2.2.2. Water: Clean and potable.

2.3. REINFORCEMENT AND ANCHORAGE

- 2.3.1. Masonry Veneer Anchors: 2-piece anchors that permit differential movement between masonry veneer and structural backup, hot dip galvanized to ASTM A 153/A 153M, Class B.
 - 2.3.1.1. Anchor plates: Not less than 0.075 inch thick, designed for fastening to structural backup through sheathing by two fasteners; provide design with legs that penetrate sheathing and insulation to provide positive anchorage.
 - 2.3.1.2. Wire ties: Manufacturer's standard shape, 0.1875 inch thick.
 - 2.3.1.3. Vertical adjustment: Not less than 3-1/2 inches.
- 2.3.2. Strap Anchors: Bent steel shapes, 1-1/2-inch width, 0.105-inch thickness, 24-inch length; with 1-1/2 inches long, 90-degree bend at each end to form U or Z shape or with cross pins; hot-dip galvanized in accordance with ASTM A153/A153M Class B.

2.4. FLASHINGS

- 2.4.1. Metal Flashing Materials: Copper, as specified in Section 07 62 00.
- 2.4.2. Metal Flashing Materials:

2.4.2.1. Prefabricated Metal Flashing: Smooth fabricated 12 oz/sq ft flashing for surface mounted conditions.

2.4.3. Flashing Sealant/Adhesives: Silicone, polyurethane, or silyl-terminated polyether/polyurethane, or other type required or recommended by flashing manufacturer; type capable of adhering to type of flashing used.

2.5. ACCESSORIES

2.5.1. Weeps:

2.5.1.1. Type: Preformed aluminum vents with sloping louvers.

2.5.2. Cavity Vents:

2.5.2.1. Type: Polyester mesh.

2.5.3. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

2.6. MORTAR AND GROUT MIXING

2.6.1. Mortar for Unit Masonry: ASTM C270, Proportion Specification.

3. PART 3 EXECUTION

3.1. EXAMINATION

3.1.1. Verify that field conditions are acceptable and are ready to receive masonry.

3.1.2. Verify that related items provided under other sections are properly sized and located.

3.1.3. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.2. COURSING

3.2.1. Establish lines, levels, and coursing indicated. Protect from displacement.

3.2.2. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

3.2.3. Brick Units:

3.2.3.1. Bond: Running.

3.2.3.2. Mortar Joints: Concave.

3.3. PLACING AND BONDING

3.3.1. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.

3.3.2. Remove excess mortar as work progresses.

3.3.3. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

3.3.4. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

3.3.5. Isolate top joint of masonry veneer from horizontal structural framing members or support angles with compressible joint filler.

3.4. WEEPS/CAVITY VENTS

3.4.1. Install weeps in veneer walls at 24 inches on center horizontally on top of through-wall flashing above shelf angles and lintels and at bottom of walls.

3.4.2. Install cavity vents in veneer walls at 32 inches on center horizontally below shelf angles and lintels and at top of walls.

3.5. REINFORCEMENT AND ANCHORAGE - MASONRY VENEER

- 3.5.1. Masonry Back-Up: Embed anchors to bond veneer at maximum 16 inches on center vertically and 36 inches on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.
- 3.5.2. Stud Back-Up: Secure veneer anchors to stud framed back-up and embed into masonry veneer at maximum 16 inches on center vertically and 24 inches on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.

3.6. MASONRY FLASHINGS

- 3.6.1. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
 - 3.6.1.1. Extend flashings full width at such interruptions and at least 6 inches, minimum, into adjacent masonry or turn up at least 1 inch, minimum, to form watertight pan at non-masonry construction.
 - 3.6.1.2. Remove or cover protrusions or sharp edges that could puncture flashings.
 - 3.6.1.3. Seal lapped ends and penetrations of flashing before covering with mortar.
- 3.6.2. Terminate flashing up 8 inches minimum on vertical surface of backing:
 - 3.6.2.1. Install vertical leg of flashing behind water-resistive barrier sheet over backing.
- 3.6.3. Install flashing in accordance with manufacturer's instructions and BIA Technical Notes No. 7.

3.7. TOLERANCES

- 3.7.1. Install masonry within the site tolerances found in TMS 402/602.
- 3.7.2. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.
- 3.7.3. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.
- 3.7.4. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.
- 3.7.5. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.
- 3.7.6. Maximum Variation of Mortar Joint Thickness: Head joint, minus 1/4 inch, plus 3/8 inch.

3.8. CUTTING AND FITTING

- 3.8.1. Cut and fit for pipes and conduit. Coordinate with other sections of work to provide correct size, shape, and location.
- 3.8.2. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.9. CLEANING

- 3.9.1. Remove excess mortar and mortar smears as work progresses.
- 3.9.2. Replace defective mortar. Match adjacent work.
- 3.9.3. Clean soiled surfaces with cleaning solution.

3.10. PROTECTION

- 3.10.1. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 05 21 00

STEEL JOIST FRAMING

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Open web steel joists, with bridging, attached seats and anchors.
- 1.1.2. Loose bearing members, such as plates or angles, and anchor bolts for site placement.

1.2. REFERENCE STANDARDS

- 1.2.1. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- 1.2.2. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished; 2024.
- 1.2.3. ASTM F436/F436M - Standard Specification for Hardened Steel Washers Inch and Metric Dimensions; 2024.
- 1.2.4. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi, 144 ksi, and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength; 2025.
- 1.2.5. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2025.
- 1.2.6. FM (AG) - FM Approval Guide; Current Edition.
- 1.2.7. SJI 100 - Standard Specifications for K-Series, LH-Series, and DLH-Series Open Web Steel Joists, and for Joist Girders; 2020.
- 1.2.8. SJI Technical Digest No. 9 - Handling and Erection of Steel Joists and Joist Girders; 2025.
- 1.2.9. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.
- 1.2.10. SSPC-SP 2 - Hand Tool Cleaning; 2024.
- 1.2.11. UL (DIR) - Online Certifications Directory; Current Edition.
- 1.2.12. UL (FRD) - Fire Resistance Directory; Current Edition.

1.3. SUBMITTALS

- 1.3.1. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- 1.3.2. Shop Drawings: Indicate standard designations, joist coding, configurations, sizes, spacings, cambers, locations of joists, joist leg extensions, bridging, connections, and attachments.

1.4. QUALITY ASSURANCE

- 1.4.1. Design connections not detailed on drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.
- 1.4.2. Perform Work, including that for headers and other supplementary framing, in accordance with SJI 100 Standard Specifications Load Tables and SJI Technical Digest No. 9.
- 1.4.3. Manufacturer Qualifications: Company specializing in performing the work of this section with minimum ten years documented experience.
- 1.4.4. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and dated no more than 12 months before start of scheduled welding work.

1.5. DELIVERY, STORAGE, AND HANDLING

- 1.5.1. Transport, handle, store, and protect products to SJI requirements.
-

2. PART 2 PRODUCTS

2.1. MATERIALS

- 2.1.1. Open Web Joists: Types as indicated on drawings:
 - 2.1.1.1. Provide bottom chord extensions as indicated.
 - 2.1.1.2. Minimum End Bearing on Steel Supports: Comply with referenced SJI standard.
 - 2.1.1.3. Minimum End Bearing on Concrete or Masonry Supports: Comply with referenced SJI standard.
 - 2.1.1.4. Finish: Shop primed.
- 2.1.2. Tension Control Bolts: Twist-off type; ASTM F3125/F3125M.
- 2.1.3. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- 2.1.4. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.2. FINISH

- 2.2.1. Shop prime joists as specified.
- 2.2.2. Prepare surfaces to be finished in accordance with SSPC-SP 2.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Verify existing conditions prior to beginning work.

3.2. ERECTION

- 3.2.1. Erect joists with correct bearing on supports.
- 3.2.2. Allow for erection loads. Provide sufficient temporary bracing to maintain framing safe, plumb, and in true alignment.
- 3.2.3. Coordinate the placement of anchors for securing loose bearing members furnished as part of the work of this section.
- 3.2.4. After joist alignment and installation of framing, field weld joist seats to steel bearing surfaces.
- 3.2.5. Do not permit erection of decking until joists are braced, bridged, and secured or until completion of erection and installation of permanent bridging and bracing.
- 3.2.6. Do not field cut or alter structural members without approval of joist manufacturer.

3.3. TOLERANCES

- 3.3.1. Maximum Variation From Plumb: 1/4 inch.
- 3.3.2. Maximum Offset From True Alignment: 1/4 inch.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 05 73 00

DECORATIVE METAL RAILINGS

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Railing systems.

1.2. REFERENCE STANDARDS

- 1.2.1. AAMA 611 - Specification for Anodized Architectural Aluminum; 2024.
- 1.2.2. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.
- 1.2.3. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- 1.2.4. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes; 2025.
- 1.2.5. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.
- 1.2.6. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2023.
- 1.2.7. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.
- 1.2.8. ASTM B211/B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire; 2019.
- 1.2.9. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.
- 1.2.10. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings; 2021.
- 1.2.11. ASTM E985 - Standard Specification for Permanent Metal Railing Systems and Rails for Buildings; 2024.
- 1.2.12. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi, 144 ksi, and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength; 2025.
- 1.2.13. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.
- 1.2.14. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.

1.3. SUBMITTALS

- 1.3.1. See Section 01 30 00 - Administrative Requirements for submittal procedures.
 - 1.3.2. Product Data: Submit manufacturer's product data, including description of materials, components, finishes, fabrication details, glass, anchors, and accessories.
 - 1.3.3. Shop Drawings: Indicate railing system elevations and sections, details of profile, dimensions, sizes, connection attachments, anchorage, size and type of fasteners, and accessories. Indicate anchor and joint locations, brazed connections, transitions, and terminations.
 - 1.3.4. Manufacturer's Instructions: Indicate installation.
 - 1.3.5. Specimen warranty.
 - 1.3.6. Executed warranty.
-

1.4. QUALITY ASSURANCE

- 1.4.1. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with at least ten years of documented experience.

1.5. DELIVERY, STORAGE, AND HANDLING

- 1.5.1. Deliver materials in factory-provided protective coverings and packaging.
- 1.5.2. Protect materials against damage during transit, delivery, storage, and installation at site.
- 1.5.3. Inspect materials upon delivery for damage. Replace damaged items.
- 1.5.4. Prior to installation, store materials and components under cover in dry location.

1.6. FIELD CONDITIONS

- 1.6.1. Ambient Conditions:
 - 1.6.1.1. Do not install railings until project is enclosed and ambient temperature of space is minimum 65 degrees F and maximum 95 degrees F.
 - 1.6.1.2. Maintain ambient temperature of space at minimum 65 degrees F and maximum 95 degrees F for 24 hours before, during, and after railing installation.

1.7. WARRANTY

- 1.7.1. Manufacturer's Warranty: Manufacturer's standard 1-year warranty against defects in materials, fabrication, finishes, and installation commencing on 11-27-2026; complete forms in Whitefield Library's name and register with manufacturer.

2. PART 2 PRODUCTS

2.1. MANUFACTURERS

- 2.1.1. Decorative Metal Railings:
 - 2.1.1.1. Viva Railings, LLC: www.vivarailings.com/#sle.
 - 2.1.1.2. Any product equal and approved.
 - 2.1.1.3. Substitutions: See Section 01 60 00 - Product Requirements.
- 2.1.2. Railing Components:
 - 2.1.2.1. Viva Railings - Circa Picket with Wood Handrail.
 - 2.1.2.2. Any product equal and approved.

2.2. RAILING SYSTEMS

- 2.2.1. General: Factory- or shop-fabricated to suit project conditions, for proper connection to building structure, and in largest sizes practical for delivery to site.
- 2.2.2. Performance Requirements:
 - 2.2.2.1. Comply with ASTM E985.
 - 2.2.2.2. Comply with ADA Standards.
 - 2.2.2.3. Structural Requirements: Design and fabricate railings and anchorages to resist loads without failure, damage, or permanent set.
 - A. Handrail and Top Rails: Applying loads simultaneously not required:
 - A) Distributed Load: 50 lbf/ft minimum, applied horizontally and vertically at top of handrail.
 - B) Concentrated Load: 200 lbf, minimum, when applied to handrail horizontally and vertically.
 - B. Infill:

- A) Concentrated Load: 50 lbf, minimum, when applied to infill horizontally and vertically.
- 2.2.3. Assembly: Use slip-on, nonweld mechanical fittings, flanges, escutcheons, and wall brackets to join lengths, seal open ends, and conceal exposed mounting bolts and nuts.
- 2.2.4. Joints: Machined smooth with hairline seams; tightly fitted and secured.
- 2.2.5. Field Connections: Provide sleeves to accommodate site assembly and installation.
- 2.2.6. Metal Railing: Engineered, post-supported railing system with metal infill.
 - 2.2.6.1. Configuration: Guardrail only.
 - 2.2.6.2. Decorative Flanges for Embedded Posts: Circular, collared cover plate without screw holes.
 - 2.2.6.3. Wall-Mounted Components: Support railing with 1-1/2-inch clearance from wall using the following:
 - 2.2.6.4. Fasteners: Concealed.
 - 2.2.6.5. Basis of Design: Viva Railings, LLC; CIRCA: www.vivarailings.com/#sle.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Verify that substrate and site conditions are acceptable and ready to receive work.
- 3.1.2. Verify field dimensions of locations and areas to receive work.
- 3.1.3. Notify Alba Architects immediately of conditions that would prevent satisfactory installation.
- 3.1.4. Do not proceed with work until detrimental conditions are corrected.

3.2. PREPARATION

- 3.2.1. Review installation drawings before beginning installation. Coordinate diagrams, templates, instructions, and directions for installation of anchorages and fasteners.
- 3.2.2. Clean surfaces to receive railings. Remove materials and substances detrimental to installation.

3.3. INSTALLATION

- 3.3.1. Install in accordance with manufacturer's instructions.
- 3.3.2. Install components plumb and level, accurately fitted, free from distortion or defects, and with tight joints, except where necessary for expansion.
- 3.3.3. Anchor securely to structure.
- 3.3.4. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.
- 3.3.5. Isolate dissimilar materials with bituminous coating, bushings, grommets, or washers to prevent electrolytic corrosion.

3.4. TOLERANCES

- 3.4.1. Maximum Variation From Plumb: 1/4 inch per floor level, noncumulative.
- 3.4.2. Maximum Offset From True Alignment: 1/4 inch.
- 3.4.3. Maximum Out-of-Position: 1/4 inch.

3.5. CLEANING

- 3.5.1. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements.
- 3.5.2. Remove protective film from exposed metal surfaces.
- 3.5.3. Metal: Clean exposed metal finishes with potable water and mild detergent in accordance with manufacturer recommendations; do not use abrasive materials or chemicals, detergents, or other substances that may damage material or finish.

3.6. PROTECTION

- 3.6.1. Protect installed components and finishes from damage after installation.
- 3.6.2. Repair damage to exposed, making finishes indistinguishable from undamaged areas.
- 3.6.3. Replace finishes and components that have irreparable damage. Ensure damaged areas are indistinguishable from undamaged finishes and surfaces.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 06 03 00

CONSERVATION TREATMENT FOR PERIOD WOOD

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Repair of damaged wood components.
- 1.1.2. Replacement of damaged wood components.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 09 91 13 - Exterior Painting.
- 1.2.2. Section 09 91 23 - Interior Painting.
- 1.2.3. Section 09 93 00 - Staining and Transparent Finishing.

1.3. DEFINITIONS

- 1.3.1. Consolidant: Chemical product to strengthen loose or deteriorated wood.
- 1.3.2. Dutchman: Repair method in which deteriorated wood component is removed in part and replaced with salvaged, harvested, or new wood.
- 1.3.3. In situ: Repair procedure in which wood elements and components remain in place and are repaired without removal from the system they are a part of.
- 1.3.4. New Elements: New, nonhistoric materials added to wood structures to aid in resistance to structural loads or water infiltration.
- 1.3.5. Patch: Use of substitute repair materials to treat damaged or deteriorated components in situ.
- 1.3.6. Surface Treatment: Application of traditional materials or contemporary chemical products to the surface of wood components to provide protection and reduce water infiltration.

1.4. REFERENCE STANDARDS

- 1.4.1. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
- 1.4.2. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.
- 1.4.3. AWPA M4 - Standard for the Handling, Storage, Field Fabrication and Field Treatment of Preservative-Treated Wood Products; 2023.
- 1.4.4. NELMA (SGR) - Standard Grading Rules for Northeastern Lumber; 2024.

1.5. SUBMITTALS

- 1.5.1. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- 1.5.2. Product Data: Provide data on cleaning compounds.

1.6. DELIVERY, STORAGE, AND HANDLING

- 1.6.1. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.
 - 1.6.1.1. Store replacement wood components for interior elements in conditioned, indoor space.

2. PART 2 PRODUCTS

2.1. REPLACEMENT ROUGH CARPENTRY MATERIALS

- 2.1.1. Grading Agency: Northeastern Lumber Manufacturers Association; NELMA (SGR).
- 2.1.2. Sizes: Nominal sizes as indicated on drawings, S4S.
- 2.1.3. Moisture Content: S-dry or MC19.
- 2.1.4. Stud Framing, 2 by 2 through 2 by 6:
 - 2.1.4.1. Species: Allowed under referenced grading rules.
 - 2.1.4.2. Grade: No.2.
- 2.1.5. Joist, Rafter, and Small Beam Framing, 2 by 6 through 4 by 16:
 - 2.1.5.1. Species: Allowed under grading rules.
- 2.1.6. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
 - 2.1.6.1. Lumber: S4S, No.2 or Standard Grade.
 - 2.1.6.2. Boards: Standard or No.3.

2.2. REPLACEMENT FINISH CARPENTRY MATERIALS

- 2.2.1. Wood or Wood-Based Materials:
 - 2.2.1.1. Wood fabricated from old growth timber is not permitted.
- 2.2.2. Quality Standard: Items fabricated in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 12, unless noted otherwise.
- 2.2.3. Surface Burning Characteristics: Provide materials having fire and smoke properties as required by applicable code.
- 2.2.4. Interior Finish Carpentry Items: Matching existing elements.

2.3. CLEANING MATERIALS

- 2.3.1. Cleaning Agent: Detergent type.

2.4. MOLD REMOVAL MATERIALS

2.5. WOOD REPAIR MATERIALS

- 2.5.1. Source Limitations: Obtain compatible consolidants and patching and filling compounds from single manufacturer.

2.6. BONDING ADHESIVES

- 2.6.1. General: Products for repairing and bonding wood and wood-based materials.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Verify that surfaces to be cleaned and restored are ready for work of this section.

3.2. PREPARATION

- 3.2.1. Protect surrounding elements from damage that may result due to performance of restoration procedures.
- 3.2.2. Remove and store removable items located in areas to be restored including, but not limited to, fixtures, fittings, finish hardware, and accessories; reinstall upon completion.
- 3.2.3. Separate areas to be protected from restoration areas to prevent damage.

- 3.2.4. Mask or cover adjacent surfaces and permanent equipment. Secure coverings without nails or tapes that leave residue. Do not use impervious sheeting which produces condensation.
 - 3.2.4.1. Use materials that withstand cleaning and restoration procedures.
- 3.2.5. When using liquid cleaning methods, install drainage devices to prevent runoff over adjacent surfaces unless those surfaces are impervious to damage from runoff.
- 3.2.6. Do not allow cleaning runoff to drain into sanitary or storm sewers.

3.3. IN SITU RESTORATION

- 3.3.1. Do not mix or apply materials or products when the ambient temperature or humidity are outside range recommended by their manufacturers.
- 3.3.2. Schedule conservation treatments to avoid weather-related failures.

3.4. MOLD REMOVAL

- 3.4.1. Apply removal formulation with foaming sprayer, airless sprayer, HVLP sprayer, pressure sprayer, trigger sprayer, brush, or mop, as required for surfaces being treated.
- 3.4.2. Apply to contaminated elements and allow surfaces to remain wet minimum 10 minutes to allow remover to penetrate, unless otherwise recommended by chemical manufacturer.
- 3.4.3. At areas of heavy, persistent contamination, scrub with stiff bristle brush to accelerate cleaning action and work remover deeper into substrate.

3.5. REPLACEMENT ELEMENT INSTALLATION

- 3.5.1. Match existing elements unless otherwise required for protection of wood materials from the weather and approved by Architect.
- 3.5.2. Maintain continuity of historic architectural fabric.
- 3.5.3. Rough Carpentry Elements:
 - 3.5.3.1. Set structural members level and plumb.
 - 3.5.3.2. Provide for erection loads, and temporary bracing to maintain structure safe, plumb, and in true alignment until completion of erection and installation of permanent bracing.
 - 3.5.3.3. Do not field cut or alter structural members without approval of Alba Architects.
- 3.5.4. Finish Carpentry:
 - 3.5.4.1. Exterior Elements: Coordinate sequence of reinstallation with period treatment sequences of other exterior elements.
 - A. General: Use corrosion-resistant fasteners.
 - B. Set and secure materials and components in place, plumb, and level.
 - C. Scribe to abutting components, with gaps of 1/32 inch, maximum. Do not use overlay trim to conceal larger gaps.
 - 3.5.4.2. Interior Elements:
 - A. Do not begin installation until wood materials have been acclimated to interior conditions.
 - B. Standing and Running Trim: Attach using finishing nails. Set finish nail heads just below the surface of trim.
 - A) Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use overlay trim to conceal larger gaps.
 - B) Attach using finishing nails. Set finish nail heads just below the surface of trim.

3.6. REPAIR

- 3.6.1. General: Use corrosion-resistant or nonferrous fasteners. Isolate dissimilar metals from each other.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 06 10 00 ROUGH CARPENTRY

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Structural dimension lumber framing.
- 1.1.2. Structural composite lumber framing.
- 1.1.3. Nonstructural dimension lumber framing.
- 1.1.4. Rough opening framing for doors, windows, and roof openings.
- 1.1.5. Sheathing.
- 1.1.6. Subflooring.
- 1.1.7. Miscellaneous framing and sheathing.
- 1.1.8. Communications and electrical room mounting boards.
- 1.1.9. Concealed wood blocking, nailers, and supports.
- 1.1.10. Miscellaneous wood nailers, furring, and grounds.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 07 62 00 - Sheet Metal Flashing and Trim: Sill flashings.

1.3. REFERENCE STANDARDS

- 1.3.1. ANSI A208.1 - American National Standard for Particleboard; 2022.
- 1.3.2. APA PRR 410 - Standard for Performance-Rated Engineered Wood Rim Boards; 2021.
- 1.3.3. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
- 1.3.4. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025.
- 1.3.5. ASTM C557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing; 2003 (Reapproved 2017).
- 1.3.6. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.
- 1.3.7. ASTM D3498 - Standard Specification for Adhesives for Field-Gluing Wood Structural Panels (Plywood or Oriented Strand Board) to Wood Based Floor System Framing; 2019a.
- 1.3.8. ASTM D5456 - Standard Specification for Evaluation of Structural Composite Lumber Products; 2021, with Editorial Revision.
- 1.3.9. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2024.
- 1.3.10. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014 (Reapproved 2021).
- 1.3.11. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials; 2021a.
- 1.3.12. ASTM E2357 - Standard Test Method for Determining Air Leakage Rate of Air Barrier Assemblies; 2024.
- 1.3.13. AWC (WFCM) - Wood Frame Construction Manual for One- and Two-Family Dwellings; 2024, with Errata.

- 1.3.14. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- 1.3.15. ICC (IECC) - International Energy Conservation Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- 1.3.16. NELMA (SGR) - Standard Grading Rules for Northeastern Lumber; 2024.
- 1.3.17. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components; 2025.
- 1.3.18. PS 1 - Structural Plywood; 2023.
- 1.3.19. PS 2 - Performance Standard for Wood Structural Panels; 2019.
- 1.3.20. PS 20 - American Softwood Lumber Standard; 2025.
- 1.3.21. UL (DIR) - Online Certifications Directory; Current Edition.

1.4. SUBMITTALS

- 1.4.1. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- 1.4.2. Structural Composite Lumber: Submit manufacturer's published structural data including span tables, marked to indicate which sizes and grades are being used; if structural composite lumber is being substituted for dimension lumber or timbers, submit grading agency structural tables marked for comparison.

1.5. DELIVERY, STORAGE, AND HANDLING

- 1.5.1. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

1.6. WARRANTY

- 1.6.1. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- 1.6.2. Manufacturer Warranty: Provide 2-year manufacturer warranty for materials and workmanship commencing on Date of Substantial Completion.

2. PART 2 PRODUCTS

2.1. GENERAL REQUIREMENTS

- 2.1.1. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
 - 2.1.1.1. If no species is specified, provide species graded by the agency specified; if no grading agency is specified, provide lumber graded by grading agency meeting the specified requirements.
 - 2.1.1.2. Grading Agency: Grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee at www.alsc.org, and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

2.2. DIMENSION LUMBER FOR CONCEALED APPLICATIONS

- 2.2.1. Grading Agency: Northeastern Lumber Manufacturers Association; NELMA (SGR).
- 2.2.2. Sizes: Nominal sizes as indicated on drawings, S4S.
- 2.2.3. Moisture Content: S-dry or MC19.
- 2.2.4. Stud Framing (2 by 2 through 2 by 6): See Structural Drawings & Specifications.
- 2.2.5. Joist, Rafter, and Small Beam Framing (2 by 6 through 4 by 16): See Structural Drawings & Specifications.
- 2.2.6. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
 - 2.2.6.1. Lumber: S4S, No. 2 or Standard Grade.

2.2.6.2. Boards: Standard or No. 3.

2.3. TIMBERS FOR CONCEALED APPLICATIONS

2.3.1. See Structural Drawings and Specifications.

2.4. STRUCTURAL COMPOSITE LUMBER

2.4.1. See Structural Drawings and Specifications.

2.4.2. At Contractor's option, structural composite lumber may be substituted for concealed dimension lumber and timbers.

2.4.3. Structural Composite Lumber Materials: Factory-fabricated engineered wood products consisting of wood veneers, strands, or flakes pressed with moisture-resistant adhesive into blocks of material, evaluated in accordance with ASTM D5456.

2.4.3.1. Laminated Veneer Lumber (LVL): Engineered wood products consisting of thin wood veneer bonded together with adhesive with grain of veneers running parallel to long dimension.

2.4.3.2. Parallel Strand Lumber (PSL): Engineered wood products consisting of long wood strands bonded together with adhesive with grain running parallel to long dimension.

2.4.3.3. Laminated Strand Lumber (LSL): Engineered wood products consisting of flaked wood strands bonded together with adhesive.

2.4.3.4. Oriented Strand Lumber (OSL): Engineered wood product consisting of flaked wood strands bonded together with adhesive.

2.5. CONSTRUCTION PANELS

2.5.1. See Structural Drawings and Specifications.

2.6. ACCESSORIES

2.6.1. Metal and Finish of Fasteners:

2.6.1.1. Untreated Wood: Hot-dip galvanized steel complying with ASTM A153/A153M Class D.

2.6.1.2. Masonry Anchors: Toggle bolt type for anchorage to hollow masonry.

2.6.2. Anchors: Toggle bolt type for anchorage to hollow masonry.

2.6.3. Die-Stamped Connectors: Hot dipped galvanized steel, sized to suit framing conditions.

2.6.4. Joist Hangers: Hot dipped galvanized steel, sized to suit framing conditions.

2.6.4.1. For contact with preservative treated wood in exposed locations, provide minimum G185 galvanizing complying with ASTM A653/A653M.

2.6.5. Sill Gasket on Top of Foundation Wall: 3/8 inch thick, closed-cell plastic foam.

2.6.5.1. Width: 5-1/2 inches.

2.6.5.2. Ultraviolet (UV) and Weathering Resistance: Approved in writing by manufacturer for up to 30 days of weather exposure.

2.6.6. Sill Flashing: See Section 07 62 00.

2.6.7. Subfloor Adhesives: Gap-filling construction adhesive for bonding wood structural panels to wood-based floor system framing; complying with ASTM D3498.

2.6.8. General Purpose Construction Adhesives: Comply with ASTM C557.

3. PART 3 EXECUTION

3.1. PREPARATION

3.1.1. Where wood framing bears on cementitious foundations, install full width sill flashing continuous over top of foundation, lap ends of flashing minimum of 4 inches and seal.

- 3.1.2. Install sill gasket under sill plate of framed walls bearing on foundations; puncture gasket cleanly to fit tightly around protruding anchor bolts.
- 3.1.3. Coordinate installation of rough carpentry members specified in other sections.

3.2. INSTALLATION - GENERAL

- 3.2.1. Select material sizes to minimize waste.
- 3.2.2. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

3.3. FRAMING INSTALLATION

- 3.3.1. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance of exposed members.
- 3.3.2. Make provisions for temporary construction loads, and provide temporary bracing sufficient to maintain structure in true alignment and safe condition until completion of erection and installation of permanent bracing.
- 3.3.3. Install structural members full length without splices unless otherwise specifically detailed.
- 3.3.4. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes and AWC (WFCM) Wood Frame Construction Manual.
- 3.3.5. Install horizontal spanning members with crown edge up and not less than 1-1/2 inches of bearing at each end.
- 3.3.6. Construct double joist headers at floor and ceiling openings and under wall stud partitions that are parallel to floor joists; use metal joist hangers unless otherwise detailed.
- 3.3.7. Provide bridging at joists in excess of 8 feet span as detailed. Fit solid blocking at ends of members.
- 3.3.8. Frame wall openings with two or more studs at each jamb; support headers on cripple studs.

3.4. BLOCKING, NAILERS, AND SUPPORTS

- 3.4.1. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.
- 3.4.2. In framed assemblies that have concealed spaces, provide solid wood fireblocking as required by applicable local code, to close concealed draft openings between floors and between top story and roof/attic space; other material acceptable to authorities having jurisdiction may be used in lieu of solid wood blocking.
- 3.4.3. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.
- 3.4.4. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.
- 3.4.5. Provide nonstructural framing and blocking to support the following:
 - 3.4.5.1. Cabinets and shelf supports.
 - 3.4.5.2. Wall brackets.
 - 3.4.5.3. Handrails.
 - 3.4.5.4. Grab bars.
 - 3.4.5.5. Towel and bath accessories.
 - 3.4.5.6. Wall-mounted door stops.
 - 3.4.5.7. Chalkboards and marker boards.
 - 3.4.5.8. Joints of rigid wall coverings that occur between studs.
 - 3.4.5.9. Other wall- or ceiling-mounted items indicated on drawings.

3.5. ROOF-RELATED CARPENTRY

- 3.5.1. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.
- 3.5.2. Provide wood curb at each roof opening except where prefabricated curbs are specified and where specifically indicated otherwise; form corners by alternating lapping side members.

3.6. INSTALLATION OF CONSTRUCTION PANELS

- 3.6.1. Subflooring/Underlayment Combination: Glue and nail to framing; staples are not permitted.
- 3.6.2. Subflooring: Glue and nail to framing; staples are not permitted.
- 3.6.3. Underlayment: Secure to subflooring with nails and glue.
 - 3.6.3.1. At locations where resilient flooring will be installed, fill and sand splits, gaps, and rough areas.
 - 3.6.3.2. Place building paper between floor underlayment and subflooring.
- 3.6.4. Roof Sheathing: Secure panels with long dimension perpendicular to framing members, with ends staggered and over firm bearing.
 - 3.6.4.1. At long edges use sheathing clips where joints occur between roof framing members.
 - 3.6.4.2. Nail panels to framing; staples are not permitted.
- 3.6.5. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using nails, screws, or staples.
 - 3.6.5.1. Install plywood wall sheathing in accordance with manufacturer's current ICC-ES evaluation report for specified sheathing product.
 - 3.6.5.2. Use plywood or other acceptable structural panels at building corners, for not less than 96 inches, measured horizontally.
- 3.6.6. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches on center on all edges and into studs in field of board.
 - 3.6.6.1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.
 - 3.6.6.2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
 - 3.6.6.3. Install adjacent boards without gaps.
 - 3.6.6.4. Size: 48 by 96 inches, installed horizontally at ceiling height.

3.7. TOLERANCES

- 3.7.1. Framing Members: 1/4 inch from true position, maximum.
- 3.7.2. Surface Flatness of Floor: 1/8 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.
- 3.7.3. Variation from Plane, Other than Floors: 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

3.8. CLEANING

- 3.8.1. Waste Disposal: See Section 01 74 19 - Construction Waste Management and Disposal.
 - 3.8.1.1. Comply with applicable regulations.
 - 3.8.1.2. Do not burn scrap on project site.
 - 3.8.1.3. Do not burn scraps that have been pressure treated.
 - 3.8.1.4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or "waste-to-energy" facilities.
- 3.8.2. Do not leave wood, shavings, sawdust, etc. on the ground or buried in fill.

3.8.3. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 06 17 53

SHOP-FABRICATED WOOD TRUSSES

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Shop-fabricated wood trusses.
- 1.1.2. Truss bridging.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 06 10 00 - Rough Carpentry.

1.3. REFERENCE STANDARDS

- 1.3.1. ANSI/TPI 1 - National Design Standard for Metal-Plate-Connected Wood Truss Construction; 2014.
- 1.3.2. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025.
- 1.3.3. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- 1.3.4. SBCA (BCSI) - Building Component Safety Information: Guide to Good Practice for Handling, Installing, Restraining & Bracing of Metal Plate Connected Wood Trusses; 2018 (Updated 2020).

1.4. SUBMITTALS

- 1.4.1. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- 1.4.2. Shop Drawings: Show truss configurations, sizes, spacing, size and type of plate connectors, cambers, framed openings, bearing and anchor details, and bridging and bracing.
 - 1.4.2.1. Include identification of engineering software used for design.
 - 1.4.2.2. Provide shop drawings stamped or sealed by design engineer.
- 1.4.3. Designer's Qualification Statement.
- 1.4.4. Fabricator's Qualification Statement.

1.5. QUALITY ASSURANCE

- 1.5.1. Designer Qualifications: Perform design by or under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State in which the Project is located.
- 1.5.2. Fabricator Qualifications: Company specializing in manufacturing the products specified in this section with minimum ten years of documented experience.

1.6. DELIVERY, STORAGE, AND HANDLING

- 1.6.1. Handle trusses in accordance with SBCA (BCSI).
- 1.6.2. Store trusses in vertical position resting on bearing ends.

2. PART 2 PRODUCTS

2.1. TRUSSES

- 2.1.1. Wood Trusses: Design and fabricate trusses in accordance with ANSI/TPI 1 and to achieve specified design requirements indicated.

2.2. MATERIALS

- 2.2.1. Lumber:
 - 2.2.1.1. Moisture Content: Between 7 and 9 percent.
 - 2.2.1.2. Lumber fabricated from old growth timber is not permitted.
- 2.2.2. Steel Connectors: Hot-dipped galvanized steel sheet, ASTM A653/A653M Structural Steel (SS) Grade 33/230, with G90/Z275 coating; die stamped with integral teeth; thickness as indicated.
- 2.2.3. Truss Bridging: Type, size and spacing recommended by truss manufacturer.

2.3. ACCESSORIES

- 2.3.1. Wood Blocking, Bridging, Plates, and Miscellaneous Framing: As specified in Section 06 10 00.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Verify that field measurements are as indicated.
- 3.1.2. Verify that supports and openings are ready to receive trusses.

3.2. PREPARATION

- 3.2.1. Coordinate placement of bearing items.

3.3. ERECTION

- 3.3.1. Install trusses in accordance with manufacturer's instructions, SBCA (BCSI); maintain a copy of applicable documents on site until installation is complete.
- 3.3.2. Set members level and plumb, in correct position.
- 3.3.3. Make provisions for erection loads, and for sufficient temporary bracing to maintain structure plumb, and in true alignment until completion of erection and installation of permanent bracing.
- 3.3.4. Do not field-cut or alter structural members without approval of Alba Architects.
- 3.3.5. Install permanent bridging and bracing.
- 3.3.6. Install headers and supports to frame openings required.
- 3.3.7. Coordinate placement of decking with work of this section.

3.4. TOLERANCES

- 3.4.1. Framing Members: 1/2 inch maximum, from true position.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 06 20 00 FINISH CARPENTRY

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Finish carpentry items.
- 1.1.2. Hardware.
- 1.1.3. Shop finishing.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 09 91 23 - Interior Painting.
- 1.2.2. Section 09 93 00 - Staining and Transparent Finishing.

1.3. REFERENCE STANDARDS

- 1.3.1. ANSI A208.2 - Medium Density Fiberboard (MDF) for Interior Applications; 2022.
- 1.3.2. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2015 (Reaffirmed 2020).
- 1.3.3. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- 1.3.4. AWI (QCP) - Quality Certification Program; Current Edition.
- 1.3.5. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
- 1.3.6. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.
- 1.3.7. BHMA A156.9 - Cabinet Hardware; 2020.
- 1.3.8. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- 1.3.9. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.
- 1.3.10. PS 1 - Structural Plywood; 2023.
- 1.3.11. PS 20 - American Softwood Lumber Standard; 2025.
- 1.3.12. UL (DIR) - Online Certifications Directory; Current Edition.

1.4. ADMINISTRATIVE REQUIREMENTS

- 1.4.1. Coordinate the work with plumbing rough-in, electrical rough-in, and installation of associated and adjacent components.

1.5. DELIVERY, STORAGE, AND HANDLING

- 1.5.1. Deliver factory-fabricated units to project site in original packages, containers or bundles bearing brand name and identification.
- 1.5.2. Store finish carpentry items under cover, elevated above grade, and in a dry, well-ventilated area not exposed to heat or sunlight.
- 1.5.3. Protect from moisture damage.
- 1.5.4. Handle materials and products to prevent damage to edges, ends, or surfaces.

2. PART 2 PRODUCTS

2.1. FINISH CARPENTRY ITEMS

- 2.1.1. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
- 2.1.2. Surface Burning Characteristics: Provide materials having fire and smoke properties as required by applicable code.
- 2.1.3. Interior Woodwork Items:
 - 2.1.3.1. Moldings, Bases, Casings, and Miscellaneous Trim: Maple; prepare for paint finish. All profiles to match existing.
 - 2.1.3.2. Door, Glazed Light, and Pocket Door Frames: Maple; prepare for paint finish. All profiles to match existing.
 - 2.1.3.3. Window Sills: Clear fir; prepare for transparent finish.

2.2. LUMBER MATERIALS

- 2.2.1. Hardwood Lumber: Maple species, quarter sawn, maximum moisture content of 6 percent ; with vertical grain , of quality suitable for transparent finish.

2.3. PLASTIC LAMINATE MATERIALS

2.4. FASTENINGS

- 2.4.1. Adhesive for Purposes Other Than Laminate Installation: Suitable for the purpose; not containing formaldehyde or other volatile organic compounds.
- 2.4.2. Adhesive for factory-fabricated units: Manufacturer's recommended adhesive for application.

2.5. ACCESSORIES

- 2.5.1. Adhesive: Type recommended by fabricator to suit application.
- 2.5.2. Lumber for Shimming and Blocking: Softwood lumber of indicated species.
- 2.5.3. Aluminum Trim and Mouldings: Extruded, alloy 6063 T5.
 - 2.5.3.1. Type: Profile as selected from manufacturer's standard range.
- 2.5.4. Primer: Alkyd primer sealer.
- 2.5.5. Wood Filler: Solvent base, tinted to match surface finish color.

2.6. HARDWARE

- 2.6.1. Countertop Support Brackets: Fixed, L-shaped, corner reinforced, face-of-stud mounting.
 - 2.6.1.1. Material: Steel.
 - A. Finish: Manufacturer's standard, factory-applied, textured powder coat.
 - B. Color: Black.
 - C. Height: 5 inches.
 - D. Support Length: 8 inches.
- 2.6.2. Countertop Brackets: Fixed, L-shaped, top of knee wall mounting.
 - 2.6.2.1. Finish: Manufacturer's standard, factory-applied, textured powder coat.
 - 2.6.2.2. Color: Black.
 - 2.6.2.3. Height: 6 inches.
- 2.6.3. Countertop Brackets: Concealed vertical leg, side-of-stud mounting.
 - 2.6.3.1. Material: Steel plates.
 - A. Finish: Manufacturer's standard, factory-applied powder coat.
 - B. Color: Black.
 - C. Vertical Leg: 8 inches.

- D. Support Plate Length: 7 inches.
- E. Plate Thickness: 1/2 inch.

2.7. FABRICATION

- 2.7.1. Shop assemble work for delivery to site, permitting passage through building openings.
- 2.7.2. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.
- 2.7.3. Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs.

2.8. SHOP FINISHING

- 2.8.1. Sand work smooth and set exposed nails and screws.
- 2.8.2. Apply wood filler in exposed nail and screw indentations.
- 2.8.3. On items to receive transparent finishes, use wood filler that matches surrounding surfaces and is of type recommended for the applicable finish.
- 2.8.4. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:
 - 2.8.4.1. Transparent:
 - A. System - 1, Lacquer, Nitrocellulose.
 - B. Stain: As selected by Alba Architects.
 - C. Sheen: Flat.
 - 2.8.4.2. Opaque:
 - A. System - 4, Latex Acrylic, Water-based.
 - B. Color: As selected by Alba Architects.
 - C. Sheen: Satin.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Verify adequacy of backing and support framing.
- 3.1.2. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.

3.2. INSTALLATION

- 3.2.1. Install custom fabrications in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.
- 3.2.2. Install factory-fabricated units in accordance with manufacturer's printed installation instructions.
- 3.2.3. Set and secure materials and components in place, plumb and level.
- 3.2.4. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.
- 3.2.5. Install prefinished paneling with full bed contact adhesive applied to substrate.

3.3. PREPARATION FOR SITE FINISHING

- 3.3.1. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.
- 3.3.2. Before installation, prime paint surfaces of items or assemblies to be in contact with cementitious materials.

3.4. TOLERANCES

- 3.4.1. Maximum Variation from True Position: 1/16 inch.
- 3.4.2. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 07 11 13

BITUMINOUS DAMPPROOFING

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Bituminous dampproofing.
- 1.1.2. Protection boards.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 07 21 00 - Thermal Insulation: Rigid insulation board used as protection board.

1.3. REFERENCE STANDARDS

- 1.3.1. ASTM D41/D41M - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing; 2011 (Reapproved 2023).
- 1.3.2. ASTM D449/D449M - Standard Specification for Asphalt Used in Dampproofing and Waterproofing; 2003 (Reapproved 2021).
- 1.3.3. ASTM D4479/D4479M - Standard Specification for Asphalt Roof Coatings - Asbestos-Free; 2007 (Reapproved 2024).
- 1.3.4. NRCA (WM) - The NRCA Waterproofing Manual; 2021.

1.4. SUBMITTALS

- 1.4.1. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- 1.4.2. Product Data: Provide properties of primer, bitumen, and mastics.

1.5. QUALITY ASSURANCE

1.6. FIELD CONDITIONS

- 1.6.1. Maintain ambient temperatures above 40 degrees F for 24 hours before and during application until dampproofing has cured.

2. PART 2 PRODUCTS

2.1. BITUMINOUS DAMPPROOFING

- 2.1.1. Bituminous Dampproofing: Cold-applied, spray-grade; asphalt base, volatile petroleum solvents, and other content, suitable for application by spray, brush, roller, or squeegee; asbestos-free; suitable for application on vertical and horizontal surfaces.
 - 2.1.1.1. Composition: ASTM D4479/D4479M Type I, asbestos free.
 - 2.1.1.2. VOC Content: Not more than permitted by local, State, and federal regulations.
 - 2.1.1.3. Applied Thickness: 1/16 inch, minimum, wet film.

2.2. ACCESSORIES

- 2.2.1. Protection Board: Rigid insulation; see Section 07 21 00.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Verify existing conditions are acceptable prior to starting this work.
- 3.1.2. Verify substrate surfaces are durable, free of matter detrimental to adhesion or application of dampproofing system.
- 3.1.3. Verify that items penetrating surfaces to receive dampproofing are securely installed.

3.2. PREPARATION

- 3.2.1. Protect adjacent surfaces not designated to receive dampproofing.
- 3.2.2. Clean and prepare surfaces to receive dampproofing in accordance with manufacturer's instructions.
- 3.2.3. Do not apply dampproofing to surfaces unacceptable to manufacturer.
- 3.2.4. Apply mastic to seal penetrations, small cracks, or minor honeycombs in substrate.

3.3. APPLICATION

- 3.3.1. Foundation Walls: Apply two coats of asphalt dampproofing.
- 3.3.2. Foundation Walls: Patch disturbed areas of existing dampproofing with two additional coats of dampproofing of the same generic type.
- 3.3.3. Perform this work in accordance with manufacturer's instructions and NRCA (WM) applicable requirements.
- 3.3.4. Prime surfaces in accordance with manufacturer's instructions and NRCA (WM) applicable requirements.
- 3.3.5. Apply bitumen by spray application.
- 3.3.6. Apply bitumen in one coat, continuous and uniform, at a rate of 25 sq ft/gal per coat.
- 3.3.7. Apply from 2 inches below finish grade elevation down to top of footings.
- 3.3.8. Seal items watertight with mastic, that project through dampproofing surface.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 07 21 00 THERMAL INSULATION

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Board insulation at perimeter foundation wall, underside of floor slabs, and exterior wall behind _____ wall finish.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 06 10 00 - Rough Carpentry: Installation requirements for board insulation over steep slope roof sheathing or roof structure.
- 1.2.2. Section 07 26 00 - Vapor Retarders: Separate vapor retarder materials.

1.3. DEFINITIONS

- 1.3.1. Mineral Fiber Material Composition: Insulation referred to as mineral fiber block, board, and blanket insulation is composed of fibers from mineral based substances such as rock, slag, or glass and processed from the molten state into fibrous form.
 - 1.3.1.1. Based on type of insulation substance, the material will be referred to as a mineral fiber when having a rock or slag base, and glass fiber with a glass or silica sand base, also considered a mineral.
 - 1.3.1.2. Insulation blankets are flexible units consisting of felted, bonded, or unbonded fibers formed into rolls or flat cut pieces referred to as batts; rolls are simply longer versions of batts.
 - 1.3.1.3. For additional information about mineral fiber and the various classification types, refer to the following reference standards; ASTM C553, ASTM C612, ASTM C665, and ASTM C726.

1.4. REFERENCE STANDARDS

- 1.4.1. AAMA 611 - Specification for Anodized Architectural Aluminum; 2024.
- 1.4.2. ASTM C165 - Standard Test Method for Measuring Compressive Properties of Thermal Insulations; 2023.
- 1.4.3. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications; 2024.
- 1.4.4. ASTM C557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing; 2003 (Reapproved 2017).
- 1.4.5. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2023.
- 1.4.6. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation; 2014 (Reapproved 2019).
- 1.4.7. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2024.
- 1.4.8. ASTM C726 - Standard Specification for Mineral Wool Roof Insulation Board; 2024.
- 1.4.9. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2025.
- 1.4.10. ASTM D1621 - Standard Test Method for Compressive Properties of Rigid Cellular Plastics; 2016 (Reapproved 2023).

- 1.4.11. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- 1.4.12. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.
- 1.4.13. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components; 2025.

1.5. SUBMITTALS

- 1.5.1. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- 1.5.2. Product Data: Provide data on product characteristics, performance criteria, and product limitations.

1.6. FIELD CONDITIONS

- 1.6.1. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

2. PART 2 PRODUCTS

2.1. APPLICATIONS

- 2.1.1. Insulation Under Concrete Slabs: Extruded polystyrene (XPS) board.
- 2.1.2. Insulation at Perimeter of Foundation: Extruded polystyrene (XPS) board.
- 2.1.3. Insulation on Inside of Concrete and Masonry Exterior Walls: Extruded polystyrene (XPS) board.

2.2. FOAM BOARD INSULATION MATERIALS

- 2.2.1. Extruded Polystyrene (XPS) Board Insulation: Comply with ASTM C578 with either natural skin or cut cell surfaces.
 - 2.2.1.1. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
 - 2.2.1.2. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
 - 2.2.1.3. Type and Thermal Resistance, R-value: Type IV, 5.0 (0.88), minimum, per 1 inch thickness at 75 degrees F mean temperature.
 - 2.2.1.4. Complies with fire resistance requirements indicated on drawings as part of an exterior non-load-bearing exterior wall assembly when tested in accordance with NFPA 285.
 - 2.2.1.5. Board Edges: Square.
 - 2.2.1.6. Products:
 - A. Owens Corning Corporation: www.owenscorning.com/en-us/#sle.
 - B. Any product equal and approved.
 - C. Substitutions: See Section 01 60 00 - Product Requirements.
- 2.2.2. Polyisocyanurate (ISO) Board Insulation: Rigid cellular foam, comply with ASTM C1289.
 - 2.2.2.1. Classifications:
 - A. Type I: Faced with aluminum foil on both major surfaces of the core foam.
 - A) Class 1 - Non-reinforced core foam.
 - B) Compressive Strength: 16 psi, minimum.
 - C) Thermal Resistance, R-value: At 1-1/2 inch thick; 9.0, minimum, at 75 degrees F.
 - 2.2.2.2. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
 - 2.2.2.3. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
 - 2.2.2.4. Water Vapor Permeance: 1.2 perm, maximum, at 1 inch thickness, and when tested in accordance with ASTM E96/E96M, desiccant method.
 - 2.2.2.5. Board Size: 48 inch by 96 inch.

- 2.2.2.6. Board Thickness: 1.5 inch.
- 2.2.2.7. Board Edges: Square.
- 2.2.2.8. Products:
 - A. DuPont de Nemours, Inc; Thermax (ci): building.dupont.com/#sle.
 - B. Any product equal and approved.
 - C. Substitutions: See Section 01 60 00 - Product Requirements.

2.3. MINERAL FIBER BLANKET INSULATION MATERIALS

- 2.3.1. Mineral Wool Blanket Thermal Insulation: Flexible or semi-rigid preformed insulation, complying with ASTM C665.
 - 2.3.1.1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
 - 2.3.1.2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
 - 2.3.1.3. Products:
 - A. ROCKWOOL; COMFORTBATT: www.rockwool.com/#sle.
 - B. Any product equal and approved.
 - C. Substitutions: See Section 01 60 00 - Product Requirements.

2.4. ACCESSORIES

- 2.4.1. Sheet Vapor Retarder: See Section 07 26 00.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.
- 3.1.2. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.2. BOARD INSTALLATION AT FOUNDATION PERIMETER

- 3.2.1. Adhere a 6 inches wide strip of polyethylene sheet over construction, control, and expansion joints with double beads of adhesive each side of joint.
- 3.2.2. Apply adhesive to back of boards:
 - 3.2.2.1. Three continuous beads per board length.
 - 3.2.2.2. Full bed 1/8 inch thick.
- 3.2.3. Install boards horizontally on foundation perimeter.
 - 3.2.3.1. Place boards to maximize adhesive contact.
 - 3.2.3.2. Install in running bond pattern.
 - 3.2.3.3. Butt edges and ends tightly to adjacent boards and to protrusions.
- 3.2.4. Extend boards over expansion joints, unbonded to foundation on one side of joint.
- 3.2.5. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.3. BOARD INSTALLATION AT EXTERIOR WALLS

- 3.3.1. Adhere 6 inches wide strip of polyethylene sheet over expansion joints with double beads of adhesive each side of joint.
 - 3.3.1.1. Tape seal joints between sheets.
- 3.3.2. Install boards horizontally on walls.
 - 3.3.2.1. Place boards to maximize adhesive contact.
 - 3.3.2.2. Install in running bond pattern.
 - 3.3.2.3. Butt edges and ends tightly to adjacent boards and protrusions.

- 3.3.3. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.4. BOARD INSTALLATION UNDER CONCRETE SLABS

- 3.4.1. Place insulation under slabs on grade after base for slab has been compacted.
- 3.4.2. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.
- 3.4.3. Prevent insulation from being displaced or damaged while placing vapor retarder and placing slab.

3.5. BATT INSTALLATION

- 3.5.1. Install insulation and vapor retarder in accordance with manufacturer's instructions.
- 3.5.2. Install in exterior wall, roof, and ceiling spaces without gaps or voids. Do not compress insulation.
- 3.5.3. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
- 3.5.4. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.
- 3.5.5. At wood framing, place vapor retarder on warm side of insulation by stapling at 6 inches on center. Lap and seal sheet retarder joints over face of member.
- 3.5.6. Tape seal tears or cuts in vapor retarder.
- 3.5.7. Extend vapor retarder tightly to full perimeter of adjacent window and door frames and other items interrupting the plane of the membrane; tape seal in place.

3.6. PROTECTION

- 3.6.1. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 07 21 19

FOAMED-IN-PLACE INSULATION

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Foamed-in-place insulation.
 - 1.1.1.1. In exterior framed walls.
 - 1.1.1.2. In underside of roofs and ceilings.
 - 1.1.1.3. In attics and crawlspaces.

1.2. REFERENCE STANDARDS

- 1.2.1. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2021.
- 1.2.2. ASTM D1621 - Standard Test Method for Compressive Properties of Rigid Cellular Plastics; 2016 (Reapproved 2023).
- 1.2.3. ASTM D1623 - Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics; 2017 (Reapproved 2023).
- 1.2.4. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- 1.2.5. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials; 2021a.
- 1.2.6. FM 4880 - Examination Standard for Class 1 Fire Rating of Building Panels or Interior Finish Materials; 2022.
- 1.2.7. NFPA 275 - Standard Method of Fire Tests for the Evaluation of Thermal Barriers; 2022.
- 1.2.8. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2024.
- 1.2.9. UL 1040 - Standard for Safety Fire Test of Insulated Wall Construction; Current Edition, Including All Revisions.
- 1.2.10. UL 1715 - Standard for Safety Fire Test of Interior Finish Material; Current Edition, Including All Revisions.

1.3. SUBMITTALS

- 1.3.1. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- 1.3.2. Product Data: Provide product description, insulation properties, overcoat properties, and preparation requirements.
- 1.3.3. ABAA Field Quality Control Submittals: Submit third-party reports of testing and inspection as required by ABAA QAP.
- 1.3.4. ABAA Manufacturer Qualification: Submit documentation of current evaluation of proposed manufacturer and materials.
- 1.3.5. ABAA Installer Qualification: Submit documentation of current contractor accreditation and current installer certification. Keep copies of all contractor accreditation and installer certification on site during and after installation. Present on-site documentation upon request.

1.4. QUALITY ASSURANCE

- 1.4.1. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with not less than three years of documented experience.
- 1.4.2. Installer Qualifications: Company specializing in performing work of the type specified, with minimum three years documented experience, and approved by manufacturer.
- 1.4.3. Air Barrier Association of America (ABAA) Quality Assurance Program (QAP); www.airbarrier.org/#sle:
 - 1.4.3.1. Installer Qualification: Use accredited contractor, certified installers, evaluated materials, and third-party field quality control audit.
 - 1.4.3.2. Manufacturer Qualification: Use evaluated materials from a single manufacturer regularly engaged in air barrier material manufacture. Use secondary materials approved in writing by primary material manufacturer.

1.5. FIELD CONDITIONS

- 1.5.1. Do not apply foam when temperature is below that specified by the manufacturer for ambient air and substrate.

2. PART 2 PRODUCTS

2.1. MATERIALS

- 2.1.1. Foamed-In-Place Insulation: Low-density, flexible, closed cell, water vapor permeable polyurethane foam; foamed on-site, using blowing agent of water or non-ozone-depleting gas.
 - 2.1.1.1. Regulatory Requirements: Comply with applicable code for flame and smoke, concealment, and fire protection requirements.
 - A. Fire Protection: Provide 15-minute thermal barrier of 1/2 inch gypsum board or equivalent material complying with NFPA 275 test method, or foamed-in-place insulation either exposed or with covering that complies with FM 4880, NFPA 286, UL 1040, or UL 1715.
 - 2.1.1.2. Thermal Resistance: R-value of 7.0, minimum, per 1 inch thickness at 75 degrees F mean temperature when tested in accordance with ASTM C518.
 - 2.1.1.3. Air Permeance: 0.04 cfm per square foot, maximum, when tested at intended thickness in accordance with ASTM E2178 at 1.57 psf.
 - 2.1.1.4. Surface Burning Characteristics: Flame spread/smoke developed index of 25/450, maximum, when tested in accordance with ASTM E84.

2.2. ACCESSORIES

- 2.2.1. Primer: As required by insulation manufacturer.
- 2.2.2. Protective Coating: Sprayed, treated with flame retardants as required to comply with applicable codes.
 - 2.2.2.1. Coating Type: Recycled paper.
 - 2.2.2.2. Thermal Resistance, R-value: 4.5, at 1 1/2 inch thickness when tested in accordance with ASTM C518.
 - 2.2.2.3. Noise Reduction Coefficient (NRC): 0.95 for 1-1/4-inch thickness installed over foam.
 - 2.2.2.4. Bond Strength: 100 psf, minimum.
 - 2.2.2.5. Flame Spread/Smoke Developed Index: 5/5, Class A, when tested in accordance with ASTM E84.
 - 2.2.2.6. Color: Custom as selected by Architect.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Verify work within construction spaces or crevices is complete before insulation application.
- 3.1.2. Verify that surfaces are clean, dry, and free of matter that may inhibit insulation adhesion.

3.2. PREPARATION

- 3.2.1. Mask and protect adjacent surfaces from over spray or dusting.
- 3.2.2. Apply primer in accordance with manufacturer's instructions.

3.3. APPLICATION

- 3.3.1. Apply insulation in accordance with manufacturer's instructions.
- 3.3.2. Apply insulation by spray method, to a uniform monolithic density without voids.
- 3.3.3. Where applied to voids and gaps assure space for expansion to avoid pressure on adjacent materials that may bind operable parts.
- 3.3.4. Trim excess away for applied trim or remove as required for continuous sealant bead.

3.4. PROTECTION

- 3.4.1. Do not permit subsequent construction work to disturb applied insulation.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 07 25 00 WEATHER BARRIERS

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Water-resistive barriers.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 07 21 00 - Thermal Insulation: Weather barrier installed in conjunction with batt insulation.
- 1.2.2. Section 07 62 00 - Sheet Metal Flashing and Trim: Metal flashings installed in conjunction with weather barriers.

1.3. DEFINITIONS

- 1.3.1. Weather Barriers: Materials or assemblies forming water-resistive barriers, air barriers, vapor retarders, or combination of one or more assemblies.
- 1.3.2. Water-Resistive Barriers: Materials or assemblies installed behind exterior wall coverings; designed to prevent liquid water from further penetration into exterior wall assembly.

1.4. REFERENCE STANDARDS

- 1.4.1. AATCC Test Method 127 - Test Method for Water Resistance: Hydrostatic Pressure; 2018, with Editorial Revision (2019).
- 1.4.2. ASTM C1338 - Standard Test Method for Determining Fungi Resistance of Insulation Materials and Facings; 2025.
- 1.4.3. ASTM C1371 - Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers; 2015 (Reapproved 2022).
- 1.4.4. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2016 (Reapproved 2021).
- 1.4.5. ASTM D779 - Standard Test Method for Determining the Water Vapor Resistance of Sheet Materials in Contact with Liquid Water by the Dry Indicator Method; 2016.
- 1.4.6. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2025.
- 1.4.7. ASTM D3330/D3330M - Standard Test Method for Peel Adhesion of Pressure-Sensitive Tape; 2004 (Reapproved 2018).
- 1.4.8. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- 1.4.9. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.
- 1.4.10. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials; 2021a.
- 1.4.11. ASTM E2357 - Standard Test Method for Determining Air Leakage Rate of Air Barrier Assemblies; 2024.
- 1.4.12. ASTM E2556/E2556M - Standard Specification for Vapor Permeable Flexible Sheet Water-Resistive Barriers Intended for Mechanical Attachment; 2010 (Reapproved 2016).

- 1.4.13. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- 1.4.14. ICC-ES AC38 - Acceptance Criteria for Water-Resistive Barriers; 2016, with Editorial Revision (2021).
- 1.4.15. ICC-ES AC148 - Acceptance Criteria for Flexible Flashing Materials; 2017, with Editorial Revision (2021).
- 1.4.16. ICC-ES AC212 - Acceptance Criteria for Water-Resistive Coatings Used as Water-Resistive Barriers over Exterior Sheathing; 2015, with Editorial Revision (2020).
- 1.4.17. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components; 2025.

1.5. SUBMITTALS

- 1.5.1. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- 1.5.2. Product Data: Provide data on material characteristics.

1.6. FIELD CONDITIONS

- 1.6.1. Maintain temperature and humidity recommended by materials manufacturers before, during, and after installation.

2. PART 2 PRODUCTS

2.1. WATER-RESISTIVE BARRIERS

- 2.1.1. Description: Materials installed behind exterior wall coverings; designed to prevent liquid water from further penetration into exterior wall assembly. Primary materials include mechanically applied sheets; accessory materials include flashings and seam tapes.
- 2.1.2. Regulatory Requirements: For use in ICC (IBC) construction Types I, II, III, and IV buildings greater than 40 feet in height.
 - 2.1.2.1. Comply with NFPA 285 wall assembly requirements in accordance with local building code and authorities having jurisdiction (AHJ).
- 2.1.3. Plastic Sheet: Polymeric-based sheet complying with requirements of ICC-ES AC38, Grade D, with 60-minute water resistance; polyethylene sheet is not permitted.
 - 2.1.3.1. Water Resistance: Withstand hydrostatic head of 157 inches, minimum, for at least five hours; pass test method in accordance with AATCC Test Method 127.
- 2.1.4. Water-Resistive Breathable Barrier: Woven, polyolefin fabric sheet in accordance with ASTM D779, 60-minute water resistance.
 - 2.1.4.1. Water Vapor Permeance: 10 perms, minimum, when tested in accordance with ASTM E96/E96M, method A.
- 2.1.5. Water-Resistive and Air Barrier, Multilayers: Outer layers of nonwoven, spunbonded polypropylene with vapor permeable, watertight polymeric middle layer.
 - 2.1.5.1. Air Permeance: 0.0011 cfm/sq ft, maximum, when tested in accordance with ASTM E2178.
 - 2.1.5.2. Water Vapor Permeance: 28 perms, minimum, when tested in accordance with ASTM E96/E96M using Procedure A - Desiccant Method, at 73.4 degrees F.
 - 2.1.5.3. Ultraviolet (UV) and Weathering Resistance: Approved by manufacturer for up to 3 months of weather exposure.
 - 2.1.5.4. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less, Class A when tested in accordance with ASTM E84.
 - 2.1.5.5. Seam and Perimeter Tape: As recommended by sheet manufacturer.
- 2.1.6. Water-Resistive and Air Barrier, Multilayers: Nonwoven fabric laminated to polyethylene film.

- 2.1.6.1. Water Vapor Permeance: 15 perms, minimum, when tested in accordance with ASTM E96/E96M using Procedure A - Desiccant Method, at 73.4 degrees F.
- 2.1.6.2. Ultraviolet (UV) and Weathering Resistance: Approved by manufacturer for up to 3 months of weather exposure.
- 2.1.6.3. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less, Class A when tested in accordance with ASTM E84.
- 2.1.6.4. Seam and Perimeter Tape: As recommended by sheet manufacturer.

2.2. ACCESSORIES

- 2.2.1. Seal and Perimeter Tapes: As recommended by water-resistive barrier manufacturer.
- 2.2.2. Flashings and Sealants: As recommended by water-resistive barrier manufacturer for application.
- 2.2.3. Metal Flashings: See Section 07 62 00.
- 2.2.4. Sealant for Cracks and Joints In Substrates: Resilient elastomeric joint sealant compatible with substrates and weather barrier materials.
 - 2.2.4.1. Application: Apply at 30 to 40 mil, 0.030 to 0.040 inch nominal thickness.
 - 2.2.4.2. Color: To be determined.
- 2.2.5. Flexible Flashing: Self-adhering sheet flashing complying with ASTM D1970/D1970M; waive slip resistance requirement if not installed on roof.
 - 2.2.5.1. Width: 3 inches.
 - 2.2.5.2. Ultraviolet (UV) and Weathering Resistance: Approved by manufacturer for up to 30 days of weather exposure.

2.3. FASTENERS

- 2.3.1. Fasteners for Attaching Water-Resistive Barriers to Substrates: As recommended by barrier manufacturer for application.
- 2.3.2. Air- and Moisture-Sealing Insulation Fasteners: Preassembled fastener units consisting of sealing washer, screw, and gasketing tube.
 - 2.3.2.1. Length as required for thickness of insulation material and penetration of deck substrate.
 - 2.3.2.2. Thread and tip types as required for substrate material.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Verify that surfaces and conditions comply with requirements of this section.

3.2. PREPARATION

- 3.2.1. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.
- 3.2.2. Clean and prime substrate surfaces to receive adhesives and sealants in accordance with manufacturer's installation instructions.

3.3. INSTALLATION

- 3.3.1. Install materials in accordance with manufacturer's installation instructions.
- 3.3.2. Install continuous water-resistive barriers where indicated on drawings, with sheets lapped to shed water.
- 3.3.3. Apply sealants within recommended temperature range in accordance with manufacturer's installation instructions.

- 3.3.4. Mechanically Fastened Sheets:
 - 3.3.4.1. Install sheets in shingle fashion to shed water; align horizontally.
 - 3.3.4.2. Overlap seams as recommended by manufacturer, 6 inches, minimum.
 - 3.3.4.3. Overlap at outside and inside corners as recommended by manufacturer, 12 inches, minimum.
 - 3.3.4.4. Attach to framed construction with fasteners extending through sheathing into framing, and space fasteners at 12 to 18 inches on center along each framing member supporting sheathing.
 - 3.3.4.5. Attach to masonry construction using mechanical fasteners spaced at 12 to 18 inches vertically on center, and at 24 inches, maximum, horizontally on center.
 - 3.3.4.6. For applications indicated to be airtight, seal seams, laps, penetrations, tears, and cuts with self-adhesive tape; use only large-headed, gasketed fasteners as recommended by manufacturer.
 - 3.3.4.7. Where stud framing rests on concrete or masonry substrate, extend lower edge of barrier sheets at least 4 inches below bottom of framing and seal to substrate with sealant or approved mounting tape.
 - 3.3.4.8. Install water-resistive barrier over jamb flashings.
 - 3.3.4.9. Install head flashings under water-resistive barrier.
 - 3.3.4.10. At framed openings with frames having nailing flanges, extend sheet into opening and over flanges; at head of opening, seal sheet over flange and flashing.
- 3.3.5. Openings and Penetrations in Exterior Water-Resistive Barriers:
 - 3.3.5.1. Install flashing over sills, covering entire sill framing member, and extend at least 5 inches onto water-resistive barrier and at least 6 inches up jambs; mechanically fasten stretched edges.
 - 3.3.5.2. At openings filled with frames having nailing flanges, seal head and jamb flanges using a continuous bead of sealant compressed by flange and cover flanges with sealing tape at least 4 inches wide; do not seal sill flange.
 - 3.3.5.3. At openings filled with nonflanged frames, seal water-resistive barrier to each side of framing at opening using flashing at least 9 inches wide, and covering entire depth of framing.
 - 3.3.5.4. At head of openings, install flashing under water-resistive barrier extending at least 2 inches beyond face of jambs; seal water-resistive barrier to flashing.
 - 3.3.5.5. At interior face of openings, seal gaps between window and door frames and rough framing using appropriate joint sealant over backer rod.
 - 3.3.5.6. Service and Other Penetrations: Form flashing around penetrating items and seal to surface of water-resistive barrier.

3.4. PROTECTION

- 3.4.1. Do not leave materials exposed to weather longer than recommended by manufacturer.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 07 26 00 VAPOR RETARDERS

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Vapor retarders.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 03 30 00 - Cast-in-Place Concrete: Vapor retarder under concrete slabs on grade.
- 1.2.2. Section 06 10 00 - Rough Carpentry: Vapor retarders on exterior wall sheathing.
- 1.2.3. Section 07 21 00 - Thermal Insulation: Vapor retarder installed in conjunction with batt insulation.
- 1.2.4. Section 07 62 00 - Sheet Metal Flashing and Trim: Metal flashings installed in conjunction with vapor retarders.

1.3. DEFINITIONS

- 1.3.1. Vapor Retarder: Airtight barrier made of material that is relatively water vapor impermeable, to degree specified, with seams and joints sealed to adjacent surfaces.
- 1.3.2. Vapor Retarder Class: A measure of a material or assembly's ability to limit the amount of moisture that passes through that material or assembly. Vapor retarder class is defined using Procedure A, Desiccant Method at 73 degrees F and 50 percent Relative Humidity (RH), in accordance with ASTM E96/E96M and ICC (IBC)-2018, as follows:
 - 1.3.2.1. Class I: 0.1 perm or less.
 - 1.3.2.2. Class II: Greater than 0.1 perm to 1.0 perm.
 - 1.3.2.3. Class III: Greater than 1.0 perm to 10 perms.

1.4. REFERENCE STANDARDS

- 1.4.1. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2016 (Reapproved 2021).
- 1.4.2. ASTM D751 - Standard Test Methods for Coated Fabrics; 2019.
- 1.4.3. ASTM D903 - Standard Test Method for Peel or Stripping Strength of Adhesive Bonds; 1998 (Reapproved 2025).
- 1.4.4. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2025.
- 1.4.5. ASTM D4397 - Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications; 2016 (Reapproved 2023).
- 1.4.6. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- 1.4.7. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.
- 1.4.8. ICC (IBC)-2018 - International Building Code; 2018.
- 1.4.9. ICC-ES AC148 - Acceptance Criteria for Flexible Flashing Materials; 2017, with Editorial Revision (2021).
- 1.4.10. ICC-ES AC212 - Acceptance Criteria for Water-Resistive Coatings Used as Water-Resistive Barriers over Exterior Sheathing; 2015, with Editorial Revision (2020).

1.5. SUBMITTALS

- 1.5.1. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- 1.5.2. Product Data: Provide data on material characteristics, performance criteria, and limitations.

1.6. FIELD CONDITIONS

- 1.6.1. Maintain temperature and humidity recommended by materials manufacturers before, during, and after installation.

2. PART 2 PRODUCTS

2.1. VAPOR RETARDERS

- 2.1.1. Underslab Vapor Retarders: See Section 03 30 00.
- 2.1.2. Vapor Retarder Sheet: Polyethylene sheeting complying with ASTM D4397, clear colored.
 - 2.1.2.1. Thickness: 10 mil, 0.010 inch, nominal.
 - 2.1.2.2. Seam and Perimeter Tape: Polyethylene self-adhering type, mesh reinforced, 2 inches wide; compatible with sheet material.

2.2. ACCESSORIES

- 2.2.1. Sealants, Tapes, and Accessories for Sealing Vapor Retarder and Adjacent Substrates: As indicated, complying with vapor retarder manufacturer's installation instructions.
- 2.2.2. Sealant for Cracks and Joints in Substrates: Resilient elastomeric joint sealant compatible with substrates and vapor retarder materials.
 - 2.2.2.1. Application: Apply at 30 to 40 mil, 0.030 to 0.040 inch, nominal thickness.
 - 2.2.2.2. Color: To be determined.
- 2.2.3. Flexible Flashing: Self-adhesive sheet flashing complying with ASTM D1970/D1970M; slip resistance requirement waived if not installed on roof.
 - 2.2.3.1. Width: 4 inches.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Verify that surfaces and conditions comply with requirements of this section.

3.2. PREPARATION

- 3.2.1. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.

3.3. INSTALLATION

- 3.3.1. Install materials in accordance with manufacturer's installation instructions.
- 3.3.2. Vapor Retarders: Install continuous airtight barrier over surfaces indicated, with sealed seams and sealed joints to adjacent surfaces.
- 3.3.3. Apply sealants and adhesives within recommended temperature range in accordance with manufacturer's installation instructions.
- 3.3.4. Mechanically Fastened Sheets - Vapor Retarder On Interior:
 - 3.3.4.1. When insulation is installed within assembly, install vapor retarder over insulation.
 - 3.3.4.2. Anchor to wood framing using large-headed nails or staples at 12 to 18 inches on center along each framing member covered; cover fasteners with seam tape.

- 3.3.4.3. Anchor to metal framing using seam tape, adhering at least one-half of tape width to metal substrate.
- 3.3.4.4. Seal seams, laps, perimeter edges, penetrations, tears, and cuts with self-adhesive tape, providing an airtight seal.
- 3.3.4.5. Locate laps at framing members; at laps fasten one sheet to framing member then tape overlapping sheet to first sheet in shingle fashion to shed water.
- 3.3.4.6. Seal entire perimeter to structure, window and door frames, and other penetrations.
- 3.3.4.7. Where conduits, pipes, wires, ducts, outlet boxes, and other items are installed within insulation cavity, pass vapor retarder sheet behind these items and over insulation to maintain airtight seal.

3.4. PROTECTION

- 3.4.1. Do not leave materials exposed to weather longer than recommended by manufacturer.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 07 31 13 ASPHALT SHINGLES

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Asphalt shingle roofing.
- 1.1.2. Flexible sheet membranes for eave protection, underlayment, and valley protection.
- 1.1.3. Flashing.

1.2. REFERENCE STANDARDS

- 1.2.1. ASTM D226/D226M - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing; 2025.
- 1.2.2. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2025.
- 1.2.3. ASTM D3161/D3161M - Standard Test Method for Wind Resistance of Steep Slope Roofing Products (Fan-Induced Method); 2020 (Reapproved 2025).
- 1.2.4. ASTM D3462/D3462M - Standard Specification for Asphalt Shingles Made from Glass Felt and Surfaced with Mineral Granules; 2023.
- 1.2.5. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.
- 1.2.6. ASTM E108 - Standard Test Methods for Fire Tests of Roof Coverings; 2025.
- 1.2.7. ASTM F1667/F1667M - Standard Specification for Driven Fasteners: Nails, Spikes, and Staples; 2021a.
- 1.2.8. ICC-ES AC188 - Acceptance Criteria for Roof Underlayments; 2023.
- 1.2.9. NRCA (RM) - The NRCA Roofing Manual; 2026.
- 1.2.10. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.
- 1.2.11. UL (DIR) - Online Certifications Directory; Current Edition.

1.3. SUBMITTALS

- 1.3.1. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- 1.3.2. Product Data: Provide data indicating material characteristics, performance criteria, and limitations.
- 1.3.3. Warranty Documentation: Submit manufacturer warranty and ensure forms have been completed in Whitefield Library's name and registered with manufacturer.

1.4. QUALITY ASSURANCE

- 1.4.1. Manufacturer Qualifications: Company specializing in manufacture of roofing systems similar to those required for this project, with not less than 10 years of documented experience.
- 1.4.2. Installer Qualifications: Company specializing in installing asphalt shingles, with at least 5 years of documented experience.

1.5. DELIVERY, STORAGE, AND HANDLING

- 1.5.1. Deliver and store materials with labels intact in manufacturer's unopened packaging until ready for installation.

- 1.5.2. Store materials under dry and waterproof cover, well ventilated, and elevated above grade on a flat surface.
- 1.5.3. Protect materials from harmful environmental elements, construction dust, direct sunlight, and other potentially detrimental conditions.
- 1.5.4. When storing roofing materials on roofing system ensure no damage occurs to supporting members and other materials.

1.6. FIELD CONDITIONS

- 1.6.1. Do not install shingles, eave protection membrane or underlayment when surface, ambient air, or wind chill temperatures are below 45 degrees F.

1.7. WARRANTY

- 1.7.1. Provide lifetime manufacturer's warranty for coverage against black streaks caused by algae.
- 1.7.2. Provide 5-year manufacturer's warranty for wind damage.
- 1.7.3. Extended Correction Period: Correct defective work within 2-year period commencing on Date of Substantial Completion.

2. PART 2 PRODUCTS

2.1. MANUFACTURERS

- 2.1.1. Asphalt Shingles:
 - 2.1.1.1. CertainTeed: www.certainteed.com/#sle.
 - 2.1.1.2. GAF: www.gaf.com/#sle.
 - 2.1.1.3. IKO Industries Inc: www.iko.com/#sle.

2.2. ASPHALT SHINGLES

- 2.2.1. Asphalt Shingles: Asphalt-coated glass felt, mineral granule surfaced, complying with ASTM D3462/D3462M.
 - 2.2.1.1. Fire Resistance: Class A, complying with ASTM E108.
 - 2.2.1.2. Wind Resistance: Class A, when tested in accordance with ASTM D3161/D3161M.
 - 2.2.1.3. Fire or Wind Resistance Criteria: Provide UL (DIR) listed and labeled products.
 - 2.2.1.4. Warranted Wind Speed: Not greater than 60 mph.
 - 2.2.1.5. Algae resistant.
 - 2.2.1.6. Solar reflective.
 - 2.2.1.7. Self-sealing type.
 - 2.2.1.8. Style: Square.
 - 2.2.1.9. Color: As selected by Architect.

2.3. SHEET MATERIALS

- 2.3.1. Eave Protection Membrane:
 - 2.3.1.1. Eave Protection Membrane: Self-adhering polymer-modified asphalt sheet complying with ASTM D1970/D1970M; 40 mil total thickness; with strippable treated release paper and polyethylene sheet top surface.
- 2.3.2. Underlayment: Synthetic non-asphaltic sheet, intended by manufacturer for mechanically fastened roofing underlayment without sealed seams.
 - 2.3.2.1. Type: Woven polypropylene with anti-slip polyolefin coating on both sides.
 - 2.3.2.2. Minimum Requirements: Comply with requirements of ICC-ES AC188 for non-self-adhesive sheet.
 - 2.3.2.3. Self Sealability: Passing nail sealability test specified in ASTM D1970/D1970M.

- 2.3.2.4. Flammability: Minimum of Class A, when tested in accordance with ASTM E108.
- 2.3.2.5. Ultraviolet (UV) Resistance and Weatherability: Approved in writing by manufacturer for exposure to weather for minimum of six months.
- 2.3.2.6. Low Temperature Flexibility: Passing test specified in ASTM D1970/D1970M.
- 2.3.2.7. Water Vapor Permeance: Vapor retarder; maximum of 0.1 perm, when tested in accordance with ASTM E96/E96M Procedure A, desiccant method.
- 2.3.2.8. Fasteners: As recommended by manufacturer or building code qualification report or approval.
- 2.3.3. Underlayment: Self-adhering butyl-rubber sheet complying with ASTM D1970/D1970M; strippable release film.
 - 2.3.3.1. Top Surface: Polyethylene film.
 - 2.3.3.2. Self Sealability: Passing nail sealability test specified in ASTM D1970/D1970M.
 - 2.3.3.3. Low Temperature Flexibility: Passing test specified in ASTM D1970/D1970M.
 - 2.3.3.4. Water Vapor Permeance: 0.05 perm, maximum, when tested in accordance with ASTM E96/E96M, Procedure A (desiccant method).
 - 2.3.3.5. Functional Temperature Range: From minus 45 degrees F to 250 degrees F.
 - 2.3.3.6. Ultraviolet (UV) Resistance and Weatherability: Approved in writing by manufacturer for exposure to weather for minimum of six months.

2.4. FLASHING

- 2.4.1. Metal Flashings: Provide sheet metal eave edge, gable edge, ridge, ridge vents, open valley flashing, dormer flashing, and other flashing as indicated.
 - 2.4.1.1. Form flashings to protect roofing materials from physical damage and shed water.
 - 2.4.1.2. Form sections square and accurate to profile, in maximum possible lengths, free from distortion or defects detrimental to appearance or performance.
 - 2.4.1.3. Hem exposed edges of flashings minimum 1/4 inch on underside.
- 2.4.2. Aluminum Flashing: Prefinished aluminum, 26 gauge, 0.017 inch minimum thickness; stucco embossed, PVC coating, color as selected.

2.5. ACCESSORIES

- 2.5.1. Roofing Nails: Standard round wire shingle type, galvanized steel, stainless steel, aluminum roofing nails, or copper roofing nails, minimum 3/8-inch head diameter, 12-gauge, 0.109-inch nail shank diameter, 1-1/2 inches long and complying with ASTM F1667/F1667M.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Verify existing conditions prior to starting this work.
- 3.1.2. Verify roof deck is of sufficient thickness to accept fasteners.
- 3.1.3. Verify roof penetrations and plumbing stacks are in place and flashed to deck surface.
- 3.1.4. Verify roof openings are correctly framed.
- 3.1.5. Verify deck surfaces are dry, free of ridges, warps, or voids.

3.2. PREPARATION

- 3.2.1. Seal roof deck joints wider than 1/16 inch as recommended by shingle manufacturer.
- 3.2.2. At areas where eave protection membrane is to be adhered to substrate, fill knot holes and surface cracks with latex filler.
- 3.2.3. Broom clean deck surfaces before installing underlayment or eave protection.
- 3.2.4. Protect surrounding areas and adjacent surfaces from damage during execution of this work.

3.3. INSTALLATION

- 3.3.1. Eave Protection Membrane:
 - 3.3.1.1. Install eave protection membrane from eave edge to minimum 48 inches up-slope beyond interior face of exterior wall.
 - 3.3.1.2. Install eave protection membrane in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.
- 3.3.2. Underlayment:
 - 3.3.2.1. Roof Slopes Up to 4:12: Install two layers of underlayment over area not protected by eave protection, with ends and edges weather lapped minimum 4 inches; stagger end laps of each consecutive layer and nail in place.
 - 3.3.2.2. Roof Slopes Greater Than 4:12: Install underlayment perpendicular to slope of roof, with ends and edges weather lapped minimum 4 inches; stagger end laps of each consecutive layer, nail in place, and weather lap minimum 4 inches over eave protection.
 - 3.3.2.3. Weather lap and seal watertight with plastic cement any items projecting through or mounted on roof.
- 3.3.3. Valley Protection:
 - 3.3.3.1. Install one ply of smooth surfaced roll roofing, minimum 48 inches wide, centered over valleys.
 - 3.3.3.2. Weather lap joints minimum 2 inches.
 - 3.3.3.3. Nail in place minimum 18 inches on center, 1 inch from edges.
- 3.3.4. Metal Flashing:
 - 3.3.4.1. Install flashings in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.
 - 3.3.4.2. Weather lap joints minimum 2 inches and seal weather tight with plastic cement.
 - 3.3.4.3. Secure in place with nails at 6 inches on center, and conceal fastenings.
 - 3.3.4.4. Items Projecting Through or Mounted on Roofing: Flash and seal weather tight with plastic cement.
- 3.3.5. Shingles:
 - 3.3.5.1. Install shingles in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.
 - A. Fasten individual shingles using two nails per shingle, or as required by manufacturer and local building code, whichever is greater.
 - B. Fasten strip shingles using four nails per strip, or as required by manufacturer and local building code, whichever is greater.
 - 3.3.5.2. Place shingles in straight coursing pattern with 5-inch weather exposure to produce double thickness over full roof area, and provide double course of shingles at eaves.
 - 3.3.5.3. Project first course of shingles 3/4 inch beyond fascia boards.
 - 3.3.5.4. Extend shingles 1/2 inch beyond face of gable edge fascia boards.
 - 3.3.5.5. Complete installation to provide weathertight service.

3.4. CLEANING

- 3.4.1. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements.
- 3.4.2. Clean exposed work upon completion of installation; remove grease and oil films, excess joint sealer, handling marks, and debris from installation, leaving work clean and unmarked, free from dents, creases, waves, scratch marks, or other damage to finish.

3.5. PROTECTION

- 3.5.1. Do not permit traffic over finished roof surface; protect roofing until completion of project.

- 3.5.2. Touch-up, repair, or replace damaged asphalt shingles or accessories before Date of Substantial Completion.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 07 46 46

FIBER-CEMENT SIDING

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Fiber-cement siding.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 06 10 00 - Rough Carpentry: Siding substrate.
- 1.2.2. Section 07 25 00 - Weather Barriers: Water-resistive barrier under siding.
- 1.2.3. Section 07 92 00 - Joint Sealants: Sealing joints between siding and adjacent construction and fixtures.

1.3. REFERENCE STANDARDS

- 1.3.1. AAMA 611 - Specification for Anodized Architectural Aluminum; 2024.
- 1.3.2. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025.
- 1.3.3. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.
- 1.3.4. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.
- 1.3.5. ASTM C1186 - Standard Specification for Flat Fiber-Cement Sheets; 2022, with Editorial Revision (2023).
- 1.3.6. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- 1.3.7. ASTM E136 - Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750 Degrees C; 2024c.
- 1.3.8. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components; 2025.

1.4. SUBMITTALS

- 1.4.1. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- 1.4.2. Product Data: Submit manufacturer's data sheets on each product to be used, including:
 - 1.4.2.1. Manufacturer's requirements for related materials to be installed by others.
 - 1.4.2.2. Preparation instructions and recommendations.
 - 1.4.2.3. Storage and handling requirements and recommendations.
 - 1.4.2.4. Installation methods, including nail patterns.
- 1.4.3. Manufacturer's qualification statement.
- 1.4.4. Installer's qualification statement.

1.5. QUALITY ASSURANCE

- 1.5.1. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.
 - 1.5.2. Installer Qualifications: Company specializing in performing work of type specified in this section with not less than three years of experience.
-

1.6. DELIVERY, STORAGE, AND HANDLING

- 1.6.1. See Section 01 74 19 - Construction Waste Management and Disposal for packaging waste requirements.
- 1.6.2. Deliver and store materials in manufacturer's unopened packaging, with labels intact, until ready for installation.
- 1.6.3. Store materials under dry and waterproof cover, well ventilated, and elevated above grade on a flat surface.

1.7. FIELD CONDITIONS

- 1.7.1. Do not install panels when air temperature or relative humidity are outside manufacturer's limits.

1.8. WARRANTY

- 1.8.1. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- 1.8.2. Manufacturer Warranty: Provide manufacturer warranty for years as indicated under Fiber-Cement Siding article sub-headings for "Warranty". Complete forms in Whitefield Library's name and register with manufacturer.

2. PART 2 PRODUCTS

2.1. FIBER-CEMENT SIDING

- 2.1.1. Panel Siding: Horizontally oriented panels made of cement and cellulose fiber formed under high pressure with integral surface texture, complying with ASTM C1186, Type A, Grade II; with machined edges, for nail attachment.
 - 2.1.1.1. Length (Height): 96 inches, nominal.
 - 2.1.1.2. Width: 48 inches.
 - 2.1.1.3. Thickness: 5/16 inch, nominal.
 - 2.1.1.4. Finish: Factory applied primer.
 - 2.1.1.5. Color: As selected by Alba Architects from manufacturers full range of available colors.
 - 2.1.1.6. Warranty: 50 year limited; transferable.
 - 2.1.1.7. Products:
 - A. James Hardie Building Products, Inc; Hardie Architectural Panel: www.jameshardie.com/#sle.
 - B. Any product equal and approved.
 - C. Substitutions: See Section 01 60 00 - Product Requirements.

2.2. ACCESSORIES

- 2.2.1. Support for Cladding and Continuous Insulation: Thermal clips.
 - 2.2.1.1. Thermally-broken clips that provide attachment support for girts, angles, channels, and other cladding support framing.
 - 2.2.1.2. Fasteners: As recommended by clip manufacturer.
- 2.2.2. Trim: Same material and texture as siding.
- 2.2.3. Metal Trim: Extruded aluminum alloy 6063-T5 temper.
 - 2.2.3.1. Finish: Clear anodized.
- 2.2.4. Fasteners: Galvanized or corrosion resistant; length as required to penetrate, 1-1/4 inches, minimum.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Examine substrate, clean and repair as required to eliminate conditions that would be detrimental to proper installation.
- 3.1.2. Do not begin until unacceptable conditions have been corrected.
- 3.1.3. If substrate preparation is responsibility of another installer, notify Alba Architects of unsatisfactory preparation before proceeding.

3.2. PREPARATION

- 3.2.1. Protect surrounding areas and adjacent surfaces during execution of this work.

3.3. INSTALLATION

- 3.3.1. Install siding in accordance with manufacturer's instructions and recommendations.
 - 3.3.1.1. Read warranty and comply with terms necessary to maintain warranty coverage.
 - 3.3.1.2. Use trim details as indicated on drawings.
 - 3.3.1.3. Touch up field cut edges before installing.
 - 3.3.1.4. Pre-drill nail holes if necessary to prevent breakage.
- 3.3.2. Over Wood and Wood-Composite Sheathing: Fasten siding through sheathing into studs.
- 3.3.3. Joints in Vertical Siding: Install Z-flashing in horizontal joints between successive courses of vertical siding.
- 3.3.4. Do not install siding less than 6 inches from ground surface, or closer than 1 inch to roofs, patios, porches, and other surfaces where water may collect.
- 3.3.5. After installation, seal joints except lap joints of lap siding; seal around penetrations, and paint exposed cut edges.

3.4. CLEANING

- 3.4.1. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements.
- 3.4.2. Clean faced panels in accordance with manufacturer's maintenance instructions, using cleaning materials and methods acceptable to manufacturer.

3.5. PROTECTION

- 3.5.1. Protect installed products until Date of Substantial Completion.
- 3.5.2. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 07 53 23

EPDM THERMOSET SINGLE-PLY ROOFING - CARLISLE

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Adhered roof system with ethylene propylene diene monomer (EPDM) roofing membrane.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 07 62 00 - Sheet Metal Flashing and Trim: Counterflashing and reglets.

1.3. REFERENCE STANDARDS

- 1.3.1. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
- 1.3.2. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2016 (Reapproved 2021).
- 1.3.3. ASTM D4491/D4491M - Standard Test Methods for Water Permeability of Geotextiles by Permittivity; 2022.
- 1.3.4. ASTM D4637/D4637M - Standard Specification for EPDM Sheet Used in Single-Ply Roof Membrane; 2015, with Editorial Revision (2022).
- 1.3.5. ASTM E1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces; 2024.
- 1.3.6. FM (AG) - FM Approval Guide; Current Edition.
- 1.3.7. NRCA (RM) - The NRCA Roofing Manual; 2026.
- 1.3.8. UL (DIR) - Online Certifications Directory; Current Edition.
- 1.3.9. UL 790 - Standard for Standard Test Methods for Fire Tests of Roof Coverings; Current Edition, Including All Revisions.

1.4. SUBMITTALS

- 1.4.1. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- 1.4.2. Product Data: Provide manufacturer's written information listed below.
 - 1.4.2.1. Product data indicating membrane materials, flashing materials, insulation, vapor retarder, surfacing, and fasteners.
- 1.4.3. Warranty:
 - 1.4.3.1. Submit manufacturer warranty and ensure that forms have been completed in Whitefield Library's name and registered with manufacturer.
 - 1.4.3.2. Submit installer's certification that installation complies with all warranty conditions for the waterproof membrane.

1.5. QUALITY ASSURANCE

- 1.5.1. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum twenty (20) years of documented experience.
- 1.5.2. Installer Qualifications: Company specializing in performing work of this section:
 - 1.5.2.1. With minimum five years documented experience.
 - 1.5.2.2. Approved by membrane manufacturer.

1.6. DELIVERY, STORAGE, AND HANDLING

- 1.6.1. Deliver products in manufacturer's original containers, dry, undamaged, with seals and labels intact.
- 1.6.2. Protect products in weather protected environment, clear of ground and moisture.
- 1.6.3. Protect foam insulation from direct exposure to sunlight.
- 1.6.4. Keep Safety Data Sheets (SDS) at the project site at all times during transportation, storage, and installation of materials.
- 1.6.5. Comply with requirements from Whitefield Library to prevent overloading or disturbance of the structure when loading materials onto the roof.

1.7. FIELD CONDITIONS

- 1.7.1. Do not apply roofing membrane during unsuitable weather. Refer to manufacturer's written instructions.
- 1.7.2. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
- 1.7.3. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.
- 1.7.4. Proceed with work so new roofing materials are not subject to construction traffic as work progresses.
- 1.7.5. Do not allow grease, oil, fats, or other contaminants to come into direct contact with membrane.

1.8. WARRANTY

- 1.8.1. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- 1.8.2. Material Warranty: Provide membrane manufacturer's warranty agreeing to replace material that shows manufacturing defects within 10 years after installation.
- 1.8.3. System Warranty: Provide manufacturer's system warranty agreeing to repair or replace roofing that leaks or is damaged due to wind or other natural causes.
 - 1.8.3.1. Warranty Term: 20 years.
 - 1.8.3.2. For repair and replacement include costs of both material and labor in warranty.

2. PART 2 PRODUCTS

2.1. MANUFACTURERS

- 2.1.1. Carlisle SynTec Systems: www.carlisle-syntec.com/#sle.
- 2.1.2. Any product equal and approved.
- 2.1.3. Substitutions: See Section 01 60 00 - Product Requirements.

2.2. ROOFING APPLICATIONS

- 2.2.1. EPDM Membrane Roofing: One ply membrane, fully adhered, over insulation.
- 2.2.2. Roofing Assembly Performance Requirements and Design Criteria:
 - 2.2.2.1. Solar Reflectance Index (SRI): Minimum of 64 based on three-year aged value; if three-year aged data is not available, minimum of 82 initial value.
 - A. Calculate SRI in accordance with ASTM E1980.
 - B. Field applied coating may not be used to achieve specified SRI.

2.3. ROOFING MEMBRANE AND ASSOCIATED MATERIALS

- 2.3.1. Single Source Responsibility: Provide and install products from single source.
- 2.3.2. Membrane:

- 2.3.2.1. Material: Ethylene propylene diene monomer (EPDM); ASTM D4637/D4637M, Type I (non-reinforced).
- 2.3.2.2. Thickness: 45 mil, 0.045 inch, minimum.
- 2.3.2.3. Sheet Width: Factory fabricated into largest sheets possible.
- 2.3.2.4. Color: White on Black.
- 2.3.2.5. Products:
 - A. Carlisle SynTec Systems; Sure-Seal.
- 2.3.3. Seaming Materials: As recommended by membrane manufacturer.
- 2.3.4. Flexible Flashing Material: Same material as membrane.
- 2.3.5. Base Flashing: Provide waterproof, fully adhered base flashing system at all penetrations, plane transitions, and terminations.

2.4. ACCESSORIES

- 2.4.1. Prefabricated Flashing Accessories:
 - 2.4.1.1. Corners and Seams: Same material as membrane, in manufacturer's standard thicknesses.
 - 2.4.1.2. Penetrations: Same material as membrane, with manufacturer's standard cut-outs, rigid inserts, clamping rings, and flanges.
 - 2.4.1.3. Sealant Pockets: Same material as membrane, with manufacturer's standard accessories, in manufacturer's standard configuration.
 - 2.4.1.4. Carlisle SynTec Systems; Sure-Seal Pressure-Sensitive Reinforced Universal Securement Strip (RUSS):
 - A. Any product equal and approved.
- 2.4.2. Membrane Adhesive: As recommended by membrane manufacturer.
- 2.4.3. Surface Conditioner for Adhesives: Compatible with membrane and adhesives.
- 2.4.4. Sealants: As recommended by membrane manufacturer.
- 2.4.5. Cleaner: Manufacturer's standard, clear, solvent-based cleaner.
- 2.4.6. Edgings and Terminations: Manufacturer's standard edge and termination accessories.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Verify that surfaces and site conditions are ready to receive work.
- 3.1.2. Verify deck is supported and secure.
- 3.1.3. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.
- 3.1.4. Verify deck surfaces are dry and free of snow or ice.
- 3.1.5. Verify that roof openings, curbs, and penetrations through roof are solidly set, and cant strips are in place.

3.2. PREPARATION, GENERAL

- 3.2.1. Clean substrate thoroughly prior to roof application.
- 3.2.2. Do not begin work until other work that requires foot or equipment traffic on roof is complete.
- 3.2.3. Apply manufacturer's recommended vapor retarder or temporary roof before roof installation.

3.3. WOOD DECK PREPARATION

- 3.3.1. Verify flatness and tightness of joints of wood decking. Verify that all wood decking edges are fully supported. Fill knot holes with latex filler or completely cover with securely nailed sheet metal.

- 3.3.2. Confirm dry deck by moisture meter with 12 percent moisture maximum.

3.4. INSTALLATION - GENERAL

- 3.4.1. Perform work in accordance with manufacturer's instructions.
- 3.4.2. Do not apply roofing membrane during unsuitable weather.
- 3.4.3. Do not apply roofing membrane when ambient temperature is outside the temperature range recommended by manufacturer.
- 3.4.4. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
- 3.4.5. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.
- 3.4.6. Coordinate the work with installation of associated counterflashings installed by other sections as the work of this section proceeds.

3.5. MEMBRANE APPLICATION

- 3.5.1. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.
- 3.5.2. Shingle joints on sloped substrate in direction of drainage.
- 3.5.3. Fully Adhered Application: Apply adhesive at manufacturer's recommended rate. Fully embed membrane in adhesive except in areas directly over or within 3 inches of expansion joints. Fully adhere one roll before proceeding to adjacent rolls.
- 3.5.4. Overlap edges and ends and seal seams by contact adhesive, minimum 3 inches. Seal permanently waterproof.
- 3.5.5. At intersections with vertical surfaces:
 - 3.5.5.1. Extend membrane over cant strips and up a minimum of 4 inches onto vertical surfaces.
 - 3.5.5.2. Fully adhere flexible flashing over membrane and up to nailing strips.
- 3.5.6. Coordinate installation of roof drains and sumps and related flashings, locate field splices away from low areas and roof drains, and lap upslope sheet over downslope sheet.
- 3.5.7. Daily Seal: Install daily seal per manufacturer's instructions at the end of each workday. Prevent infiltration of water at incomplete flashings, terminations, and at unfinished membrane edges.

3.6. CLEANING

- 3.6.1. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements.
- 3.6.2. Remove wrappings, empty containers, paper, and other debris from the roof daily. Dispose of debris in compliance with local, State, and Federal regulations.
- 3.6.3. Remove bituminous markings from finished surfaces.
- 3.6.4. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions.
- 3.6.5. Repair or replace defaced or damaged finishes caused by work of this section.

3.7. PROTECTION

- 3.7.1. Protect installed roofing and flashings from construction operations.
- 3.7.2. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 07 54 00

THERMOPLASTIC MEMBRANE ROOFING

1. PART 2 PRODUCTS

1.1. MEMBRANE ROOFING AND ASSOCIATED MATERIALS

- 1.1.1. Membrane Roofing Materials:
 - 1.1.1.1. Sheet Width:
- 1.1.2. Seaming Materials: As recommended by membrane manufacturer.
- 1.1.3. Flexible Flashing Material: Same material as membrane.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 07 62 00

SHEET METAL FLASHING AND TRIM

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Fabricated sheet metal items, including flashings, counterflashings, exterior penetrations, and other items indicated in Schedule.
- 1.1.2. Sealants for joints within sheet metal fabrications.

1.2. REFERENCE STANDARDS

- 1.2.1. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.
- 1.2.2. ASTM B370 - Standard Specification for Copper Sheet and Strip for Building Construction; 2022.
- 1.2.3. ASTM B749 - Standard Specification for Lead and Lead Alloy Strip, Sheet, and Plate Products; 2025.
- 1.2.4. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018 (Reapproved 2024).
- 1.2.5. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2024).
- 1.2.6. CDA A4050 - Copper in Architecture - Handbook; Current Edition.
- 1.2.7. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

1.3. SUBMITTALS

- 1.3.1. See Section 01 30 00 - Administrative Requirements for submittal procedures.

1.4. QUALITY ASSURANCE

- 1.4.1. Perform work in accordance with SMACNA (ASMM) and CDA A4050 requirements and standard details, except as otherwise indicated.

1.5. DELIVERY, STORAGE, AND HANDLING

- 1.5.1. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- 1.5.2. Prevent contact with materials that could cause discoloration or staining.

2. PART 2 PRODUCTS

2.1. SHEET MATERIALS

- 2.1.1. Anodized Aluminum: ASTM B209/B209M, 3005 alloy, H12 or H14 temper; 0.032 inch thick; anodized finish of color as selected.
- 2.1.2. Lead Sheet: ASTM B749, 0.047-inch minimum thickness; UNS Number L51121.
- 2.1.3. Copper: ASTM B370, cold rolled 16 oz/sq ft, 24 gauge, 0.0216 inch thick; natural finish.

2.2. PREFINISHED ALUMINUM SHEETS

- 2.2.1. Description: Factory-applied topcoat systems applied to aluminum flat sheet substrates prior to fabrication by coil coating; topcoat systems consist of primers and organic topcoats on exposed side and backing coats on unexposed side.
- 2.2.2. Aluminum Sheet Substrates: ASTM B209/B209M, alloy and temper as recommended by manufacturer for application.

2.3. FABRICATION

- 2.3.1. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- 2.3.2. Form pieces in longest possible lengths.
- 2.3.3. Hem exposed edges on underside 1/2 inch; miter and seam corners.
- 2.3.4. Form material with flat lock seams, except where otherwise indicated; at moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
- 2.3.5. Fabricate corners from one piece with minimum 18-inch long legs; seam for rigidity, seal with sealant.
- 2.3.6. Fabricate flashings to allow toe to extend 2 inches over roofing gravel. Return and brake edges.

2.4. FLASHING

- 2.4.1. Flashing Panels for Exterior Wall Penetrations: Premanufactured components and accessories as required to preserve integrity of building envelope; suitable for conduits and facade materials to be installed.

2.5. ACCESSORIES

- 2.5.1. Fasteners: Same material and finish as flashing metal, with soft neoprene washers.
- 2.5.2. Primer Type: Zinc chromate.
- 2.5.3. Concealed Sealants: Non-curing butyl sealant.
- 2.5.4. Exposed Sealants: ASTM C920; elastomeric sealant, with minimum movement capability as recommended by manufacturer for substrates to be sealed; color to match adjacent material.
- 2.5.5. Fenestration Perimeter Flashing Attachments: Two-piece flashing receiver and clip of extruded aluminum, at least 0.045 inch thick, for attaching flashing at perimeter of exterior wall fenestration openings.
 - 2.5.5.1. Provide flashing receiver profile appropriate for flashing applications.
- 2.5.6. Asphalt Roof Cement: ASTM D4586/D4586M, Type I, asbestos-free.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.
- 3.1.2. Verify roofing termination and base flashings are in place, sealed, and secure.

3.2. PREPARATION

- 3.2.1. Install starter and edge strips, and cleats before starting installation.
- 3.2.2. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil, 0.015 inch.

3.3. INSTALLATION

- 3.3.1. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted.
- 3.3.2. Apply plastic cement compound between metal flashings and felt flashings.
- 3.3.3. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- 3.3.4. Exterior Flashing Receivers: Install in accordance with manufacturer's recommendations, and in proper relationship with adjacent construction, and as follows:
- 3.3.5. Seal metal joints watertight.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 07 84 00

FIRESTOPPING

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Firestopping systems.
- 1.1.2. Firestopping of joints and penetrations in fire-resistance-rated and smoke-resistant assemblies, whether indicated on drawings or not, and other openings indicated.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 09 21 16 - Gypsum Board Assemblies: Gypsum wallboard fireproofing.

1.3. REFERENCE STANDARDS

- 1.3.1. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009 (Reapproved 2016).
- 1.3.2. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2024.
- 1.3.3. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2024.
- 1.3.4. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems; 2024.
- 1.3.5. ASTM E2174 - Standard Practice for On-Site Inspection of Installed Firestop Systems; 2024.
- 1.3.6. ASTM E2307 - Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-Story Test Apparatus; 2025.
- 1.3.7. ASTM E2393 - Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers; 2024.
- 1.3.8. ASTM E2837 - Standard Test Method for Determining the Fire Resistance of Continuity Head-of-Wall Joint Systems Installed between Rated Wall Assemblies and Nonrated Horizontal Assemblies; 2023a, with Editorial Revision (2024).
- 1.3.9. FM (AG) - FM Approval Guide; Current Edition.
- 1.3.10. ITS (DIR) - Directory of Listed Products; Current Edition.
- 1.3.11. SCAQMD 1168 - Adhesive and Sealant Applications; 1989, with Amendment (2022).
- 1.3.12. UL (DIR) - Online Certifications Directory; Current Edition.
- 1.3.13. UL (FRD) - Fire Resistance Directory; Current Edition.
- 1.3.14. UL 1479 - Standard for Fire Tests of Penetration Firestops; Current Edition, Including All Revisions.
- 1.3.15. UL 2079 - Standard for Tests for Fire Resistance of Building Joint Systems; Current Edition, Including All Revisions.

1.4. SUBMITTALS

- 1.4.1. Schedule of Firestopping: List each type of penetration, fire rating of the penetrated assembly, and firestopping test or design number.
- 1.4.2. Product Data: Provide data on product characteristics, performance ratings, and limitations.
- 1.4.3. Sustainable Design Submittal: Submit VOC content documentation for nonpreformed materials.
- 1.4.4. Manufacturer's qualification statement.

1.5. QUALITY ASSURANCE

- 1.5.1. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.
 - 1.5.1.1. Listing in UL (FRD), FM (AG), or ITS (DIR) will be considered as constituting an acceptable test report.
 - 1.5.1.2. Valid evaluation report published by ICC Evaluation Service, Inc. (ICC-ES) at www.icc-es.org will be considered as constituting an acceptable test report.
 - 1.5.1.3. Submission of actual test reports is required for assemblies for which none of the above substantiation exists.
- 1.5.2. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum ten years documented experience.

1.6. FIELD CONDITIONS

- 1.6.1. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation; maintain minimum temperature before, during, and for three days after installation of materials.
- 1.6.2. Provide ventilation in areas where solvent-cured materials are being installed.

2. PART 2 PRODUCTS

2.1. MANUFACTURERS

- 2.1.1. Firestopping Manufacturers:
 - 2.1.1.1. 3M Fire Protection Products: www.3m.com/firestop/#sle.
 - 2.1.1.2. Hilti, Inc: www.hilti.com/#sle.
 - 2.1.1.3. Substitutions: See Section 01 60 00 - Product Requirements.

2.2. MATERIALS

- 2.2.1. Firestopping Materials: Any materials meeting requirements.
- 2.2.2. Volatile Organic Compound (VOC) Content: Provide products having VOC content lower than that required by SCAQMD 1168.
- 2.2.3. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Provide type of materials as required for tested firestopping assembly.
- 2.2.4. Fire Ratings: Refer to drawings for required systems and ratings.

2.3. FIRESTOPPING ASSEMBLY REQUIREMENTS

- 2.3.1. Perimeter Fire Containment Firestopping: Use system that has been tested according to ASTM E2307 to have fire resistance F Rating equal to required fire rating of floor assembly.
- 2.3.2. Head-of-Wall (HW) Joint System Firestopping at Joints Between Fire-Rated Wall Assemblies and Non-Rated Horizontal Assemblies: Use system that has been tested according to ASTM E2837 to have fire resistance F Rating equal to required fire rating of wall assembly.
- 2.3.3. Floor-to-Floor (FF), Floor-to-Wall (FW), Head-of-Wall (HW), and Wall-to-Wall (WW) Joints, Except Perimeter, Where Both Are Fire-Rated: Use system that has been tested according to ASTM E1966 or UL 2079 to have fire resistance F Rating equal to required fire rating of the assembly in which the joint occurs.
- 2.3.4. Through Penetration Firestopping: Use system that has been tested according to ASTM E814 to have fire resistance F Rating equal to required fire rating of penetrated assembly.

2.4. FIRESTOPPING FOR FLOOR-TO-FLOOR, FLOOR-TO-WALL, HEAD-OF-WALL, AND WALL-TO-WALL JOINTS

- 2.4.1. Gypsum Board Walls:
 - 2.4.1.1. Wall-to-Wall Joints That Have Movement Capabilities (Dynamic-D):
 - A. 1 Hour Construction: UL System WW-D-0067; Hilti CP 606 Flexible Firestop Sealant.
 - 2.4.1.2. Head-of-Wall Joints at Underside of Steel Beam and Concrete Over Metal Deck Floor with Sprayed On Fireproofing:
 - A. 1 Hour Construction: UL System HW-D-0259; Hilti CFS-SP WB Firestop Joint Spray and CP 672.

2.5. FIRESTOPPING PENETRATIONS THROUGH GYPSUM BOARD WALLS

- 2.5.1. Blank Openings:
 - 2.5.1.1. 1 Hour Construction: UL System W-L-3334; Hilti CP 653 Speed Sleeve.
- 2.5.2. Penetrations By:
 - 2.5.2.1. Multiple Penetrations in Large Openings:
 - A. 1 Hour Construction: UL System W-L-1408; Hilti FS-ONE MAX Intumescent Firestop Sealant.
 - B. 1 Hour Construction: UL System W-L-8013; Hilti CFS-BL Firestop Block.
 - C. 1 Hour Construction: UL System W-L-8079; Hilti FS-ONE MAX Intumescent Firestop Sealant.
 - 2.5.2.2. Uninsulated Metallic Pipe, Conduit, and Tubing:
 - A. 1 Hour Construction: UL System W-L-1054; Hilti FS-ONE MAX Intumescent Firestop Sealant.
 - B. 1 Hour Construction: UL System W-L-1164; Hilti FS-ONE MAX Intumescent Firestop Sealant.
 - 2.5.2.3. Uninsulated Non-Metallic Pipe, Conduit, and Tubing:
 - A. 1 Hour Construction: UL System W-L-2078; Hilti CP 643N/644 Firestop Collar.
 - B. 1 Hour Construction: UL System W-L-2128; Hilti FS-ONE MAX Intumescent Firestop Sealant.
 - 2.5.2.4. Electrical Cables Not In Conduit:
 - A. 1 Hour Construction: UL System W-L-3065; Hilti FS-ONE MAX Intumescent Firestop Sealant, CP 606 Flexible Firestop Sealant, CD 601S Elastomeric Firestop Sealant, or CP 618 Firestop Putty Stick.
 - B. 1 Hour Construction: UL System W-L-3334; Hilti CP 653 Speed Sleeve.
 - C. 1 Hour Construction: UL System W-L-3393; Hilti CFS-SL RK Retrofit Sleeve Kit for Existing Cables.
 - 2.5.2.5. Cable Trays with Electrical Cables:
 - A. 1 Hour Construction: UL System W-L-4011; Hilti CFS-BL Firestop Block.
 - B. 1 Hour Construction: UL System W-L-4060; Hilti FS-ONE MAX Intumescent Firestop Sealant.
 - 2.5.2.6. Insulated Pipes:
 - A. 1 Hour Construction: UL System W-L-5028; Hilti FS-ONE MAX Intumescent Firestop Sealant.
 - B. 1 Hour Construction: UL System W-L-5029; Hilti FS-ONE Intumescent Firestop Sealant.
 - 2.5.2.7. HVAC Ducts, Insulated:
 - A. 1 Hour Construction: UL System W-L-7156; Hilti FS-ONE MAX Intumescent Firestop Sealant.

2.6. FIRESTOPPING SYSTEMS

- 2.6.1. Firestopping: Any material meeting requirements.
 - 2.6.1.1. Fire Ratings: Use system that is listed by FM (AG), ITS (DIR), or UL (FRD) and tested in accordance with ASTM E814, ASTM E119, or UL 1479 with F Rating equal to fire rating of penetrated assembly and minimum T Rating Equal to F Rating and in compliance with other specified requirements.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Verify openings are ready to receive the work of this section.

3.2. PREPARATION

- 3.2.1. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other materials that could adversely affect bond of firestopping material.
- 3.2.2. Remove incompatible materials that could adversely affect bond.

3.3. INSTALLATION

- 3.3.1. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.
- 3.3.2. Do not cover installed firestopping until inspected by authorities having jurisdiction.
- 3.3.3. Install labeling required by code.

3.4. CLEANING

- 3.4.1. Clean adjacent surfaces of firestopping materials.

3.5. PROTECTION

- 3.5.1. Protect adjacent surfaces from damage by material installation.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 07 92 00

JOINT SEALANTS

1. PART 1 GENERAL

1.1. RELATED REQUIREMENTS

- 1.1.1. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions: Additional requirements for sealants and primers.

1.2. REFERENCE STANDARDS

- 1.2.1. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer; 2015 (Reapproved 2022).
- 1.2.2. ASTM C794 - Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants; 2018 (Reapproved 2022).
- 1.2.3. ASTM C834 - Standard Specification for Latex Sealants; 2017 (Reapproved 2023).
- 1.2.4. ASTM C881/C881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete; 2020a.
- 1.2.5. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications; 2024.
- 1.2.6. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018 (Reapproved 2024).
- 1.2.7. ASTM C1087 - Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems; 2023.
- 1.2.8. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2025.
- 1.2.9. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants; 2022.
- 1.2.10. ASTM C1311 - Standard Specification for Solvent Release Sealants; 2022.
- 1.2.11. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants; 2023.
- 1.2.12. ASTM C1382 - Standard Test Method for Determining Tensile Adhesion Properties of Sealants when Used in Exterior Insulation and Finishing Systems (EIFS) Joints; 2016 (Reapproved 2023).
- 1.2.13. ASTM C1521 - Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints; 2019 (Reapproved 2025).
- 1.2.14. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2016 (Reapproved 2021).
- 1.2.15. ASTM D638 - Standard Test Method for Tensile Properties of Plastics; 2022.
- 1.2.16. ASTM D695 - Standard Test Method for Compressive Properties of Rigid Plastics; 2023.
- 1.2.17. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness; 2015 (Reapproved 2021).
- 1.2.18. ASTM D4541 - Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers; 2022.
- 1.2.19. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- 1.2.20. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2024.
- 1.2.21. SCAQMD 1168 - Adhesive and Sealant Applications; 1989, with Amendment (2022).
- 1.2.22. UL 263 - Standard for Fire Tests of Building Construction and Materials; Current Edition, Including All Revisions.

1.3. SUBMITTALS

- 1.3.1. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- 1.3.2. Product Data: Submit manufacturer's technical datasheets for each product to be used; include the following:
 - 1.3.2.1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
 - 1.3.2.2. List of backing materials approved for use with the specific product.
 - 1.3.2.3. Backing material recommended by sealant manufacturer.
 - 1.3.2.4. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
 - 1.3.2.5. Substrates the product should not be used on.
- 1.3.3. Executed warranty.

1.4. QUALITY ASSURANCE

- 1.4.1. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.5. WARRANTY

- 1.5.1. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- 1.5.2. Manufacturer Warranty: Provide 2-year manufacturer warranty for installed sealants and accessories that fail to achieve a watertight seal, exhibit loss of adhesion or cohesion, or do not cure. Complete forms in Whitefield Library's name and register with manufacturer.

2. PART 2 PRODUCTS

2.1. MANUFACTURERS

- 2.1.1. Nonsag Sealants:
 - 2.1.1.1. Bostik Inc: www.bostik-us.com/#sle.
 - 2.1.1.2. Hilti, Inc: www.hilti.com/#sle.
 - 2.1.1.3. Sika Corporation: usa.sika.com/#sle.
 - 2.1.1.4. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.
 - 2.1.1.5. W. R. Meadows, Inc: www.wrmeadows.com/#sle.
 - 2.1.1.6. Substitutions: See Section 01 60 00 - Product Requirements.

2.2. JOINT SEALANT APPLICATIONS

- 2.2.1. Scope:
 - 2.2.1.1. Exterior Joints:
 - A. Seal the following joints:
 - A) Wall expansion and control joints.
 - B) Joints between different exposed materials.
 - 2.2.1.2. Interior Joints:
 - A. Seal the following joints:
 - A) Joints between door frames and window frames and adjacent construction.
 - B) In sound-rated wall and ceiling assemblies, gaps at electrical outlets, wiring devices, and piping penetrations.
 - C) In sound-rated wall and ceiling assemblies, seal joints between wall assemblies and ceiling assemblies; between wall assemblies and other construction; between ceiling assemblies and other construction.

- 2.2.1.3. Do Not Seal:
 - A. Intentional weep holes in masonry.
 - B. Joints indicated to be covered with expansion joint cover assemblies.
 - C. Joints where sealant installation is specified in other sections.
- 2.2.2. Exterior Joints: Use nonsag nonstaining silicone sealant, unless otherwise indicated.
- 2.2.3. Interior Joints: Use nonsag polyurethane sealant, unless otherwise indicated.
- 2.2.4. Interior Wet Areas: Bathrooms, restrooms, and kitchens; fixtures in wet areas include plumbing fixtures, food service equipment, countertops, cabinets, and other similar items.

2.3. JOINT SEALANTS - GENERAL

- 2.3.1. Sealants and Primers: Provide products with acceptable levels of volatile organic compound (VOC) content; see Section 01 61 16.

2.4. NONSAG JOINT SEALANTS

- 2.4.1. Nonstaining Silicone Sealant: ASTM C920, Grade NS, Uses M, A, G, and O; not expected to withstand continuous water immersion or traffic.
 - 2.4.1.1. Movement Capability: Plus and minus 50 percent, minimum.
 - 2.4.1.2. Nonstaining to Porous Stone: Nonstaining to light-colored natural stone when tested in accordance with ASTM C1248.
 - 2.4.1.3. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.
 - 2.4.1.4. Color: Match adjacent finished surfaces.
- 2.4.2. Silicone Sealant: ASTM C920, Grade NS, Uses M, A, G, and O; not expected to withstand continuous water immersion or traffic.
 - 2.4.2.1. Movement Capability: Plus and minus 25 percent, minimum.
 - 2.4.2.2. Color: Match adjacent finished surfaces.
- 2.4.3. Polymer Sealant: ASTM C920; single component, cured sealant is paintable and mold/mildew resistant, low odor and VOC, and ultraviolet (UV) resistant.
- 2.4.4. Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multi-component; not expected to withstand continuous water immersion or traffic.
 - 2.4.4.1. Movement Capability: Plus and minus 25 percent, minimum.
 - 2.4.4.2. Color: Match adjacent finished surfaces.

2.5. ACCESSORIES

- 2.5.1. Sealant Backing Materials, General: Materials placed in joint before applying sealants; assists sealant performance and service life by developing optimum sealant profile and preventing three-sided adhesion; type and size recommended by sealant manufacturer for compatibility with sealant, substrate, and application.
- 2.5.2. Preformed Extruded Silicone Joint Seal: Pre-cured low-modulus silicone extrusion, in sizes to fit applications indicated on drawings, combined with a neutral-curing liquid silicone sealant for bonding joint seal to substrates.
 - 2.5.2.1. Size: 1 inch wide, in rolls 100 feet long.
 - 2.5.2.2. Thickness: 0.78 inch, with ridges along outside bottom edges for bonding area.
- 2.5.3. Preformed Extruded Polyurethane Joint Seal: Medium-modulus, preformed polyurethane extrusion used to bridge joints under elastomeric wall coatings, in sizes to fit applications indicated on drawings, combined with polyurethane sealant for bonding joint seal to substrates.
 - 2.5.3.1. Size: 1-1/2 inch wide, in rolls 100 feet long.
 - 2.5.3.2. Thickness: 0.051 inch, with ridges along outside bottom edges for bonding area.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Verify that joints are ready to receive work.
- 3.1.2. Verify that backing materials are compatible with sealants.

3.2. PREPARATION

- 3.2.1. Remove loose materials and foreign matter that could impair adhesion of sealant.
- 3.2.2. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.
- 3.2.3. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- 3.2.4. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

3.3. INSTALLATION

- 3.3.1. Install this work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- 3.3.2. Provide joint sealant installations complying with ASTM C1193.
- 3.3.3. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.
- 3.3.4. Install bond breaker backing tape where backer rod cannot be used.
- 3.3.5. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.
- 3.3.6. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.
- 3.3.7. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 08 11 13

HOLLOW METAL DOORS AND FRAMES

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Non-fire-rated hollow metal doors and frames.
- 1.1.2. Fire-rated hollow metal doors and frames.
- 1.1.3. Thermally insulated hollow metal doors with frames.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 08 71 00 - Door Hardware.
- 1.2.2. Section 08 80 00 - Glazing: Glass for doors and borrowed lites.
- 1.2.3. Section 09 91 13 - Exterior Painting: Field painting.
- 1.2.4. Section 09 91 23 - Interior Painting: Field painting.

1.3. ABBREVIATIONS AND ACRONYMS

- 1.3.1. ANSI: American National Standards Institute.
- 1.3.2. ASCE: American Society of Civil Engineers.
- 1.3.3. HMMA: Hollow Metal Manufacturers Association.
- 1.3.4. NAAMM: National Association of Architectural Metal Manufacturers.
- 1.3.5. NFPA: National Fire Protection Association.
- 1.3.6. SCIF: Sensitive Compartmented Information Facility.
- 1.3.7. SDI: Steel Door Institute.
- 1.3.8. UL: Underwriters Laboratories.

1.4. REFERENCE STANDARDS

- 1.4.1. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- 1.4.2. ANSI/SDI A250.3 - Test Procedure and Acceptance Criteria for Factory Applied Finish Coatings for Steel Doors and Frames; 2025.
- 1.4.3. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2024.
- 1.4.4. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames; 2024.
- 1.4.5. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2023.
- 1.4.6. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2025.
- 1.4.7. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025.
- 1.4.8. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2024.
- 1.4.9. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2023.

- 1.4.10. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- 1.4.11. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.
- 1.4.12. ASTM E336 - Standard Test Method for Measurement of Airborne Sound Attenuation Between Rooms in Buildings; 2025.
- 1.4.13. BHMA A156.115 - Hardware Preparation in Steel Doors and Frames; 2016.
- 1.4.14. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
- 1.4.15. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames; 2002.
- 1.4.16. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2024.
- 1.4.17. NAAMM HMMA 840 - Guide Specifications for Receipt, Storage and Installation of Hollow Metal Doors and Frames; 2024.
- 1.4.18. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames; 2014.
- 1.4.19. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2025.
- 1.4.20. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives; 2025.
- 1.4.21. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames; 2023.

1.5. SUBMITTALS

- 1.5.1. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- 1.5.2. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.
- 1.5.3. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.

1.6. QUALITY ASSURANCE

- 1.6.1. Manufacturer Qualifications: Provide hollow metal doors and frames from SDI Certified manufacturer: <https://steeldoors.org/sdi-certified/#sle>.
- 1.6.2. Maintain at project site copies of reference standards relating to installation of products specified.

1.7. DELIVERY, STORAGE, AND HANDLING

- 1.7.1. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
- 1.7.2. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

2. PART 2 PRODUCTS

2.1. MANUFACTURERS

- 2.1.1. Hollow Metal Doors and Frames:
 - 2.1.1.1. Steelcraft, an Allegion brand; A-14 Series: www.allegion.com/#sle.
 - 2.1.1.2. Any product equal and approved.
 - 2.1.1.3. Substitutions: See Section 01 60 00 - Product Requirements.

2.2. PERFORMANCE REQUIREMENTS

- 2.2.1. Requirements for Hollow Metal Doors and Frames:

- 2.2.1.1. Steel Sheet: Comply with one or more of the following requirements; galvanized steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.
- 2.2.1.2. Accessibility: Comply with ICC A117.1 and ADA Standards.
- 2.2.1.3. Exterior Door Top Closures: Flush end closure channel, with top and door faces aligned.
- 2.2.1.4. Door Edge Profile: Manufacturers standard for application indicated.
- 2.2.1.5. Typical Door Face Sheets: To Match Existing . Refer to Door Schedule for additional information.
- 2.2.1.6. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings. Style: Manufacturer's standard.
- 2.2.1.7. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
- 2.2.1.8. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvanized) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.
 - A. Based on SDI Standards: Provide at least A40/ZF120 (galvanized) when necessary, coating not required for typical interior door applications, and at least A60/ZF180 (galvanized) for corrosive locations.
- 2.2.2. Hollow Metal Panels: Same construction, performance, and finish as doors.
- 2.2.3. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.3. HOLLOW METAL DOORS

- 2.3.1. Door Finish: Factory primed and field finished.
- 2.3.2. Exterior Doors: Thermally insulated.
 - 2.3.2.1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
 - A. Level 2 - Heavy-duty.
 - B. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.
 - C. Model A-14 Series Entrance Doors.
 - D. Door Face Metal Thickness: 18 gauge, 0.042 inch, minimum.
 - E. Zinc Coating: A60/ZF180 galvanized coating; ASTM A653/A653M.
 - 2.3.2.2. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.
 - 2.3.2.3. Door Thickness: 1-3/4 inches, nominal.
 - 2.3.2.4. Weatherstripping: Refer to Section 08 71 00.

2.4. HOLLOW METAL FRAMES

- 2.4.1. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.
- 2.4.2. Frame Finish: Factory primed and field finished.
- 2.4.3. Exterior Door Frames: Knock-down type.
 - 2.4.3.1. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvanized) in accordance with ASTM A653/A653M, with A40/ZF120 coating.
 - 2.4.3.2. Frame Metal Thickness: 18 gauge, 0.042 inch, minimum.

- 2.4.3.3. Weatherstripping: Separate, see Section 08 71 00.
- 2.4.4. Door Frames, Fire-Rated: Knock-down type.
 - 2.4.4.1. Fire Rating: Same as door, labeled.
 - 2.4.4.2. Terminated Stops: Provide at interior doors; closed end stop terminated 6 inch, maximum, above floor at 45 degree angle.
 - 2.4.4.3. Frame Metal Thickness: 18 gauge, 0.042 inch, minimum.

2.5. FINISHES

- 2.5.1. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

2.6. ACCESSORIES

- 2.6.1. Glazing: Clear sheet glass, 1/4 inch (6 mm) thick, factory installed.
- 2.6.2. Removable Stops: Formed sheet steel, mitered or butted corners; prepared for countersink style tamper proof screws.
- 2.6.3. Astragals and Edges for Double Doors: Pairs of door astragals, and door edge sealing and protection devices.
 - 2.6.3.1. UL listed products in compliance with requirements of authorities having jurisdiction.
- 2.6.4. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.
- 2.6.5. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Verify existing conditions before starting work.
- 3.1.2. Verify that opening sizes and tolerances are acceptable.
- 3.1.3. Verify that finished walls are in plane to ensure proper door alignment.

3.2. INSTALLATION

- 3.2.1. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.
- 3.2.2. Install prefinished frames after painting and wall finishes are complete.
- 3.2.3. Install fire rated units in accordance with NFPA 80.
- 3.2.4. Coordinate frame anchor placement with wall construction.
- 3.2.5. Install door hardware as specified in Section 08 71 00.
 - 3.2.5.1. Comply with recommended practice for hardware placement of doors and frames in accordance with ANSI/SDI A250.6 or NAAMM HMMA 861.
- 3.2.6. Coordinate installation of electrical connections to electrical hardware items.

3.3. TOLERANCES

- 3.3.1. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 861.
- 3.3.2. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.4. ADJUSTING

- 3.4.1. Adjust for smooth and balanced door movement.

3.4.2. Adjust sound control doors so that seals are fully engaged when door is closed.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 08 14 33

STILE AND RAIL WOOD DOORS

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Wood doors, stile and rail design; fire rated.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 08 71 00 - Door Hardware.
- 1.2.2. Section 09 93 00 - Staining and Transparent Finishing: Field finishing.

1.3. REFERENCE STANDARDS

- 1.3.1. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2025.
- 1.3.2. ASTM E2112 - Standard Practice for Installation of Exterior Windows, Doors and Skylights; 2023.
- 1.3.3. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
- 1.3.4. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.
- 1.3.5. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- 1.3.6. ITS (DIR) - Directory of Listed Products; Current Edition.
- 1.3.7. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2025.
- 1.3.8. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives; 2025.
- 1.3.9. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2022.
- 1.3.10. UL (DIR) - Online Certifications Directory; Current Edition.
- 1.3.11. UL 10B - Standard for Fire Tests of Door Assemblies; Current Edition, Including All Revisions.
- 1.3.12. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

1.4. SUBMITTALS

- 1.4.1. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- 1.4.2. Product Data: Indicate stile and rail core materials and construction; veneer species, type and characteristics.
- 1.4.3. Shop Drawings: Illustrate door opening criteria, elevations, sizes, types, swings, undercuts required, special beveling, special blocking for hardware, factory machining criteria, factory finishing criteria, cutouts for glazing, cutouts for louvers, cutouts for _____, and _____.
- 1.4.4. Manufacturer's qualification statement.
- 1.4.5. Warranty, executed in Whitefield Library's name.

1.5. QUALITY ASSURANCE

- 1.5.1. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with not less than ten years of documented experience.

1.6. DELIVERY, STORAGE, AND HANDLING

- 1.6.1. Package, deliver, and store doors in accordance with quality standard specified.

- 1.6.2. Accept doors on site in manufacturer's packaging, and inspect for damage.
- 1.6.3. Protect doors with resilient packaging sealed with heat shrunk plastic; do not store in damp or wet areas or areas where sunlight might bleach veneer; seal top and bottom edges with tinted sealer if stored more than one week, and break seal on site to permit ventilation.

1.7. WARRANTY

- 1.7.1. Interior Doors: Provide manufacturer's warranty for the life of the installation.
- 1.7.2. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

2. PART 2 PRODUCTS

2.1. MANUFACTURERS

- 2.1.1. Stile and Rail Wood Doors:
 - 2.1.1.1. VT Industries, Inc; Egger Stile and Rail Collection: www.vtindustries.com/#sle.
 - 2.1.1.2. Any product equal and approved.
 - 2.1.1.3. Substitutions: See Section 01 60 00 - Product Requirements.

2.2. DOORS

- 2.2.1. Quality Standard: Custom Grade, Standard Duty performance, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless otherwise indicated.
- 2.2.2. Exterior Doors: 1-3/4 inches thick unless otherwise indicated; solid lumber construction; mortise and tenon joints; water repellent treated. Opaque finish as indicated on drawings.
- 2.2.3. Interior Doors: 1-3/4 inches thick unless otherwise indicated; solid lumber construction; mortise and tenon joints. Opaque finish as indicated on drawings.

2.3. DOOR AND PANEL FACINGS

- 2.3.1. Veneer Facing for Transparent Finish: White Maple, veneer grade in accordance with quality standard indicated, plain sliced (flat cut), with book match between leaves of veneer, running match of spliced veneer leaves assembled on door or panel face.
 - 2.3.1.1. Pairs: Pair match each pair; set match pairs within 10 feet of each other when doors are closed.
- 2.3.2. Adhesive: Type I - Waterproof.

2.4. DOOR CONSTRUCTION

- 2.4.1. Vertical Exposed Edge of Stiles: Of same species as veneer facing.
- 2.4.2. Fit door edge trim to edge of stiles after applying veneer facing.
- 2.4.3. Panels: Flat.
- 2.4.4. At exterior doors, provide aluminum flashing at the top and bottom rail for full thickness and width of door.
- 2.4.5. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.
- 2.4.6. Glazed Openings: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings.
- 2.4.7. Factory install glazing in doors in compliance with quality standards specified, using manufacturer's standard elastomeric glazing sealant.
- 2.4.8. Cut and configure exterior door edge to receive recessed weatherstripping devices. Provide edge clearances in accordance with referenced quality standards.

- 2.4.9. Fire Rated Doors: Mineral core type, with fire resistant composite core (FD), plies and faces as indicated above; with core blocking as required to provide adequate anchorage of hardware without through-bolting.
- 2.4.10. Fire Rated Doors: Tested to ratings indicated on drawings in accordance with NFPA 252 or UL 10B - Negative (Neutral) Pressure; listed in UL (DIR) or ITS (DIR) and without any visible seals when door is open.

2.5. FINISHES

- 2.5.1. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:
 - 2.5.1.1. Transparent:
 - A. System - 12, Polyurethane, Water-based.
 - B. Sheen: Satin.
- 2.5.2. Seal door top edge with color sealer to match door facing.

2.6. ACCESSORIES

- 2.6.1. Glazed Openings:
 - 2.6.1.1. Heat-Strengthened and Fully Tempered Glass: ASTM C1048.
 - 2.6.1.2. Glazing: Sealed insulated glazing units with 1 inch overall thickness, and consisting of two 1/4 inch thick panes of glass.
 - 2.6.1.3. Tint: Clear.
- 2.6.2. Panel or Glass Retention Molding: Wood of same species as door facing, flat bead stop, with butted corners; prepared for countersink style tamper proof screws.
- 2.6.3. Door Hardware: See Section 08 71 00.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Verify existing conditions before starting work.
- 3.1.2. Verify that opening sizes and tolerances are acceptable.
- 3.1.3. Do not install doors in frame openings that are not plumb or are out of tolerance for size or alignment.

3.2. INSTALLATION

- 3.2.1. Install doors in accordance with manufacturer's instructions and specified quality standards.
 - 3.2.1.1. Install fire-rated doors in accordance with NFPA 80 requirements.
 - 3.2.1.2. Install smoke and draft control doors in accordance with NFPA 105 requirements.
 - 3.2.1.3. Install exterior doors in accordance with ASTM E2112.
- 3.2.2. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.
- 3.2.3. Machine cut for hardware.
- 3.2.4. Coordinate installation of doors with installation of frames and hardware.

3.3. TOLERANCES

- 3.3.1. Comply with specified quality standard for fit, clearance, and joinery tolerances.
- 3.3.2. Maximum Width Distortion (Cup): 1/8 inch measured with straight edge or taut string, edge to edge, over an imaginary 36 by 84 inch surface area.

3.4. ADJUSTING

3.4.1. Adjust doors for smooth and balanced door movement.

3.5. SCHEDULE - SEE DRAWINGS

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 08 31 00
ACCESS DOORS AND PANELS

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Wall- and ceiling-mounted access units.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 09 91 23 - Interior Painting: Field paint finish.
- 1.2.2. Section 23 33 00 - Air Duct Accessories: Access doors in ductwork.

1.3. REFERENCE STANDARDS

- 1.3.1. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- 1.3.2. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- 1.3.3. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications; 2025a.
- 1.3.4. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes; 2025.
- 1.3.5. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2023.
- 1.3.6. ASTM A513/A513M - Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing; 2025.
- 1.3.7. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2024.
- 1.3.8. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2023.
- 1.3.9. ASTM B26/B26M - Standard Specification for Aluminum-Alloy Sand Castings; 2018, with Editorial Revision.
- 1.3.10. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.
- 1.3.11. ASTM B211/B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire; 2019.
- 1.3.12. FM (AG) - FM Approval Guide; Current Edition.
- 1.3.13. ITS (DIR) - Directory of Listed Products; Current Edition.
- 1.3.14. UL (FRD) - Fire Resistance Directory; Current Edition.

1.4. SUBMITTALS

- 1.4.1. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- 1.4.2. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.

2. PART 2 PRODUCTS

2.1. ACCESS DOORS AND PANELS ASSEMBLIES

2.2. WALL- AND CEILING-MOUNTED ACCESS UNITS

- 2.2.1. Manufacturers:
 - 2.2.1.1. Activar Construction Products Group, Inc. - JL Industries: www.activarcpg.com/#sle.
 - 2.2.1.2. ACUDOR Products Inc; FW-5050-ACF: www.acudor.com/#sle.
 - 2.2.1.3. Best Access Doors: www.bestaccessdoors.com/#sle.
 - 2.2.1.4. Nystrom, Inc; HVAC - Access Doors: www.nystrom.com/#sle.
 - 2.2.1.5. Substitutions: See Section 01 60 00 - Product Requirements.
- 2.2.2. Wall- and Ceiling-Mounted Units: Factory-fabricated door and frame, fully assembled units with corner joints welded, filled and ground flush; square and without rack or warp; coordinate requirements with type of installation assembly being used for each unit.
 - 2.2.2.1. Material: Steel.
 - 2.2.2.2. Style: Exposed frame with door surface flush with frame surface.
 - 2.2.2.3. Door Style: Single thickness with rolled or turned in edges.
 - 2.2.2.4. Heavy-Duty Single Steel Sheet Door Panels: 14-gauge, 0.0747-inch minimum thickness.
 - 2.2.2.5. Steel Finish: Primed.
 - 2.2.2.6. Primed and Factory Finish: Polyester powder coat; color _____.
 - 2.2.2.7. Hardware:
 - A. Hardware for Fire-Rated Units: As required for listing.
 - B. Hinges for Non-Fire-Rated Units: Concealed, constant force closure spring type.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Verify that rough openings are correctly sized and located.
- 3.1.2. Begin installation only after substrates have been properly prepared, and if the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2. PREPARATION

- 3.2.1. Clean surfaces thoroughly prior to proceeding with this work.
- 3.2.2. Prepare surfaces using methods recommended by manufacturer for applicable substrates in accordance with project conditions.

3.3. INSTALLATION

- 3.3.1. Install units in accordance with manufacturer's instructions.
- 3.3.2. Install frames plumb and level in openings, and secure units rigidly in place.
- 3.3.3. Position units to provide convenient access to concealed equipment when necessary.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 08 54 13

FIBERGLASS WINDOWS

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Factory fabricated fiberglass windows with fixed and operating sash.
- 1.1.2. Glazed by factory or on-site; including infill panels.
- 1.1.3. Operating hardware.
- 1.1.4. Insect screens.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 07 25 00 - Weather Barriers: Sealing frames to water-resistive barrier installed on adjacent construction.
- 1.2.2. Section 07 92 00 - Joint Sealants: Sealing joints between frames and adjacent construction.

1.3. REFERENCE STANDARDS

- 1.3.1. AAMA 502 - Voluntary Specification for Field Testing of Newly Installed Fenestration Products; 2021.
- 1.3.2. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; 2009.
- 1.3.1. AAMA/WDMA/CSA 101/I.S.2/A440 - North American Fenestration Standard/Specification for Windows, Doors, and Skylights; 2022, with Errata (2023).
- 1.3.2. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- 1.3.3. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
- 1.3.4. ASHRAE Std 90.1 I-P - Energy Standard for Buildings Except Low-Rise Residential Buildings; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- 1.3.5. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.
- 1.3.6. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2019.
- 1.3.7. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2023).
- 1.3.8. ASTM E783 - Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors; 2002 (Reapproved 2018).
- 1.3.9. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference; 2015 (Reapproved 2023).
- 1.3.10. ASTM E2112 - Standard Practice for Installation of Exterior Windows, Doors and Skylights; 2023.
- 1.3.11. ASTM E2353 - Standard Test Methods for Performance of Glazing in Permanent Railing Systems, Guards, and Balustrades; 2021.
- 1.3.12. FS L-S-125 - Screening, Insect, Nonmetallic; 1972b, with Notice (1987).

- 1.3.13. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence; 2023.

1.4. SUBMITTALS

- 1.4.1. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- 1.4.2. Product Data: Provide component dimensions, anchors, fasteners, glass, and internal drainage details.
- 1.4.3. Shop Drawings: Indicate opening dimensions, framed opening tolerances, affected related work, installation requirements.
- 1.4.4. Grade Substantiation: Prior to submitting shop drawings or starting fabrication, submit one of the following showing compliance with specified grade:
- 1.4.4.1. Evidence of AAMA Certification.
- 1.4.4.2. Evidence of WDMA Certification.
- 1.4.4.3. Evidence of CSA Certification.
- 1.4.4.4. Test report(s) by independent testing agency itemizing compliance and acceptable to authorities having jurisdiction.
- 1.4.5. Executed warranty.

1.5. QUALITY ASSURANCE

- 1.5.1. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with minimum 5 years of documented experience.
- 1.5.2. Installer Qualifications: Company specializing in performing work of the type specified, with minimum 5 years of documented experience.

1.6. DELIVERY, STORAGE, AND HANDLING

- 1.6.1. Protect finished surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond when exposed to sunlight or weather.
- 1.6.2. Jig, brace, and box the window frame assemblies for transport to minimize flexing of members or joints.

1.7. FIELD CONDITIONS

- 1.7.1. Do not install sealants when ambient temperature is less than 40 degrees F.

1.8. WARRANTY

- 1.8.1. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- 1.8.2. Manufacturer Warranty: Provide 10-year manufacturer warranty covering finish, including degradation or failure due to chemical contact. Complete forms in Whitefield Library's name and register with manufacturer.
- 1.8.3. Manufacturer Warranty: Provide 5-year manufacturer warranty for insulated glass units from seal failure, interpane dusting or misting, and replacement of same. Include coverage for degradation of vinyl color finish. Complete form in Whitefield Library's name and register with manufacturer.

2. PART 2 PRODUCTS

2.1. MANUFACTURERS

- 2.1.1. Fiberglass Windows:
- 2.1.1.1. Pella Corporation; Pella Impervia Windows: www.pellacommercial.com/#sle.

- 2.1.1.2. Any product equal and approved.
- 2.1.1.3. Substitutions: See Section 01 60 00 - Product Requirements.

2.2. WINDOW UNITS

- 2.2.1. Fiberglass Windows: Hollow, tubular, multilayer-fiber-reinforced pultruded material; factory fabricated; related flashings, anchorage and attachment devices, comply with ENERGY STAR requirements.
 - 2.2.1.1. Configuration: As indicated on drawings.
 - 2.2.1.2. Product Type: AP - Awning projected window, C - Casement window, and FW - Fixed window in accordance with AAMA/WDMA/CSA 101/I.S.2/A440.
 - 2.2.1.3. Interior Color: As selected by Architect from manufacturer's full line of colors.
 - 2.2.1.4. Exterior Color: As selected by Architect from manufacturer's full line of colors.
 - 2.2.1.5. Movement: Accommodate movement between window and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.
 - 2.2.1.6. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
 - 2.2.1.7. Thermal Movement: Design to accommodate thermal movement caused by 100 degrees F temperature change without buckling stress on glass, joint seal failure, damaging loads on structural elements, damaging loads on fasteners, reduction in performance or other detrimental effects.

2.3. PERFORMANCE REQUIREMENTS

- 2.3.1. Grade: AAMA/WDMA/CSA 101/I.S.2/A440 requirements for specific window type:
 - 2.3.1.1. Performance Class (PC): LC.
 - 2.3.1.2. Performance Grade (PG): 15, with minimum design pressure (DP) of 15.0 psf.
- 2.3.2. Deflection: Limit member deflection to 1/200 of the longer dimension with full recovery of glazing materials.
- 2.3.3. Condensation Resistance Factor: CRF of 60, minimum, the lower value of the glass and frame window components and determined in accordance with AAMA 1503.
- 2.3.4. Overall Thermal Transmittance (U-Value): 0.18, maximum, including glazing, measured on window sizes required for this project.
- 2.3.5. Center of Glass Solar Heat Gain Coefficient (SHGC): 0.30; comply with NFRC 200 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 7 computer program.
- 2.3.6. Water Leakage: No uncontrolled leakage on interior face when tested in accordance with ASTM E331 at differential pressure of 12.11 pounds per square foot.
- 2.3.7. Air Leakage: 0.01 cfm/sq ft maximum leakage when tested at 1.57 psf pressure difference in accordance with ASTM E283/E283M.

2.4. COMPONENTS

- 2.4.1. Insect Screens: FS L-S-125 woven plastic mesh; 14/18 mesh size.
- 2.4.2. Sealant for Setting Sills and Sill Flashing: Non-curing butyl type.

2.5. GLASS AND GLAZING MATERIALS

- 2.5.1. Glazing: Insulated double pane, annealed glass, clear, low-E coated, argon filled, bird-friendly, with thermoplastic warm-edge spacer, with glass thicknesses as recommended by manufacturer for specified wind conditions and acoustic rating indicated.

2.6. **HARDWARE**

- 2.6.1. Casement and Awning Sash: Zinc die-cast steel worm-gear operator with Painted finish.
 - 2.6.1.1. Comply with ASTM E2353 for fall protection.
- 2.6.2. Finish For Exposed Hardware: Match window finish.

2.7. **FABRICATION**

- 2.7.1. Fabricate framing, mullions and sash members with fusion welded corners and joints, in a rigid jig. Supplement frame sections with internal reinforcement where required for structural rigidity.
- 2.7.2. Form sills and stools in one piece. Slope sills for wash.
- 2.7.3. Form weather stop flange to perimeter of unit.
- 2.7.4. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
- 2.7.5. Arrange fasteners to be concealed from view.
- 2.7.6. Permit internal drainage weep holes and channels to migrate moisture to exterior. Provide internal drainage of glazing spaces to exterior through weep holes.
- 2.7.7. Assemble insect screen frame, miter and reinforced frame corners. Fit mesh taut into frame and secure. Fit frame with four spring loaded steel pin retainers.
- 2.7.8. Factory glaze window units.

3. **PART 3 EXECUTION**

3.1. **EXAMINATION**

- 3.1.1. Verify wall openings and adjoining water-resistive barrier seal materials are ready to receive work of this section.

3.2. **INSTALLATION**

- 3.2.1. Install windows in accordance with manufacturer's instructions.
- 3.2.2. Attach window frame and shims to perimeter opening to accommodate construction tolerances and other irregularities.
- 3.2.3. Align window plumb and level, free of warp or twist. Maintain dimensional tolerances and alignment with adjacent work.
- 3.2.4. Set sill members and sill flashing in continuous bead of sealant.
- 3.2.5. Install operating hardware.

3.3. **TOLERANCES**

- 3.3.1. Maximum Variation from Level or Plumb: 0.06 inches every 3 ft non-cumulative or 0.5 inches per 100 ft, whichever is less.

3.4. **ADJUSTING**

- 3.4.1. Adjust hardware for smooth operation and secure weathertight closure.

3.5. **CLEANING**

- 3.5.1. Remove protective material from pre-finished surfaces.

- 3.5.2. Wash surfaces by method recommended and acceptable to window manufacturer; rinse and wipe surfaces clean.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 08 71 00 DOOR HARDWARE

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Hardware for hollow metal doors.
- 1.1.2. Hardware for fire-rated doors.
- 1.1.3. Electrically operated and controlled hardware.
- 1.1.4. Thresholds.
- 1.1.5. Weatherstripping and gasketing.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 06 20 00 - Finish Carpentry: Wood door frames.
- 1.2.2. Section 08 11 13 - Hollow Metal Doors and Frames.
- 1.2.3. Section 08 14 33 - Stile and Rail Wood Doors.

1.3. REFERENCE STANDARDS

- 1.3.1. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- 1.3.2. BHMA A156.1 - Standard for Butts and Hinges; 2021.
- 1.3.3. BHMA A156.2 - Bored and Preamsembled Locks and Latches; 2022.
- 1.3.4. BHMA A156.3 - Exit Devices; 2025.
- 1.3.5. BHMA A156.4 - Door Closers and Pivots; 2024.
- 1.3.6. BHMA A156.5 - Cylinders and Input Devices for Locks; 2020.
- 1.3.7. BHMA A156.6 - Standard for Architectural Door Trim; 2021.
- 1.3.8. BHMA A156.7 - Template Hinge Dimensions; 2022.
- 1.3.9. BHMA A156.13 - Mortise Locks and Latches; 2022.
- 1.3.10. BHMA A156.16 - Standard for Auxiliary Hardware; 2023.
- 1.3.11. BHMA A156.17 - Self Closing Hinges & Pivots; 2025.
- 1.3.12. BHMA A156.18 - Standard for Materials and Finishes; 2020.
- 1.3.13. BHMA A156.20 - Standard for Strap and Tee Hinges, and Hasps; 2021.
- 1.3.14. BHMA A156.21 - Thresholds; 2025.
- 1.3.15. BHMA A156.22 - Standard for Gasketing; 2021.
- 1.3.16. BHMA A156.25 - Electrified Locking Devices; 2023.
- 1.3.17. BHMA A156.26 - Standard for Continuous Hinges; 2021.
- 1.3.18. BHMA A156.31 - Electric Strikes and Frame Mounted Actuators; 2024.
- 1.3.19. DHI WDHS.3 - Recommended Locations for Architectural Hardware for Flush Wood Doors; 1993; also in WDHS-1/WDHS-5 Series, 1996.
- 1.3.20. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
- 1.3.21. ITS (DIR) - Directory of Listed Products; Current Edition.
- 1.3.22. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- 1.3.23. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2025.
- 1.3.24. NFPA 101 - Life Safety Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- 1.3.25. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2022.

- 1.3.26. UL (DIR) - Online Certifications Directory; Current Edition.
- 1.3.27. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

1.4. ADMINISTRATIVE REQUIREMENTS

- 1.4.1. Coordinate the manufacture, fabrication, and installation of products that door hardware is installed on.
- 1.4.2. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.
- 1.4.3. Keying Requirements Meeting:
 - 1.4.3.1. Schedule meeting at project site prior to Contractor occupancy.
 - 1.4.3.2. Attendance Required:
 - 1.4.3.3. Agenda:
 - A. Verify locksets and locking hardware are functionally correct for project requirements.
 - B. Verify that keying and programming complies with project requirements.
 - 1.4.3.4. Incorporate "Keying Requirements Meeting" decisions into keying submittal upon review of door hardware keying system including, but not limited to, the following:
 - 1.4.3.5. Record minutes and distribute copies within two days after meeting to participants, with two copies to Alba Architects, Whitefield Library, participants, and those affected by decisions made.
 - 1.4.3.6. Deliver established keying requirements to manufacturers.

1.5. SUBMITTALS

- 1.5.1. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- 1.5.2. Product Data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project, and includes construction details, material descriptions, finishes, and dimensions and profiles of individual components.
- 1.5.3. Shop Drawings - Door Hardware Schedule: Submit detailed listing that includes each item of hardware to be installed on each door. Use door numbering scheme as included in Contract Documents.
 - 1.5.3.1. Prepared by or under supervision of Architectural Hardware Consultant (AHC).
 - 1.5.3.2. Provide complete description for each door listed.
 - 1.5.3.3. Provide manufacturer name, product names, and catalog numbers; include functions, types, styles, sizes and finishes of each item.
 - 1.5.3.4. Include account of abbreviations and symbols used in schedule.

1.6. QUALITY ASSURANCE

- 1.6.1. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum ten years of documented experience.

1.7. DELIVERY, STORAGE, AND HANDLING

- 1.7.1. Package hardware items individually; label and identify each package with door opening code to match door hardware schedule.

1.8. WARRANTY

- 1.8.1. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- 1.8.2. Manufacturer's Warranty: Provide warranty against defects in material and workmanship for period indicated. Complete forms in Whitefield Library's name and register with manufacturer.

- 1.8.2.1. Closers: Five years, minimum.
- 1.8.2.2. Exit Devices: Three years, minimum.
- 1.8.2.3. Locksets and Cylinders: Three years, minimum.
- 1.8.2.4. Other Hardware: Two years, minimum.

2. PART 2 PRODUCTS

2.1. DESIGN AND PERFORMANCE CRITERIA

- 2.1.1. Provide specified door hardware as required to make doors fully functional, compliant with applicable codes, and secure to extent indicated.
- 2.1.2. Provide individual items of single type, of same model, and by same manufacturer.
- 2.1.3. Provide door hardware products that comply with the following requirements:
 - 2.1.3.1. Applicable provisions of federal, state, and local codes.
 - 2.1.3.2. Accessibility: ADA Standards and ICC A117.1.
 - 2.1.3.3. Applicable provisions of NFPA 101.
 - 2.1.3.4. Fire-Rated Doors: NFPA 80, listed and labeled by qualified testing agency for fire protection ratings indicated, based on testing at positive pressure in accordance with NFPA 252 or UL 10C.
 - 2.1.3.5. Hardware on Fire-Rated Doors: Listed and classified by UL (DIR) as suitable for application indicated.
 - 2.1.3.6. Auxiliary Hardware: BHMA A156.16.
 - 2.1.3.7. Straps and Tee Hinges: BHMA A156.20.
- 2.1.4. Lock Function: Provide lock and latch function numbers and descriptions of manufacturer's series. See Door Hardware Schedule.
- 2.1.5. Fasteners:
 - 2.1.5.1. Provide fasteners of proper type, size, quantity, and finish that comply with commercially recognized standards for proposed applications.
 - A. Aluminum fasteners are not permitted.
 - B. Provide phillips flat-head screws with heads finished to match door surface hardware unless otherwise indicated.
 - 2.1.5.2. Fire-Rated Applications: Comply with NFPA 80.
 - A. Provide wood or machine screws for hinges mortised to doors or frames, strike plates to frames, and closers to doors and frames.
 - B. Provide steel through bolts for attachment of surface mounted closers, hinges, or exit devices to door panels unless proper door blocking is provided.

2.2. HINGES

- 2.2.1. Hinges: Comply with BHMA A156.1, Grade 1.
 - 2.2.1.1. Self Closing Hinges: Comply with BHMA A156.17.
 - 2.2.1.2. Butt Hinges: Comply with BHMA A156.1 and BHMA A156.7 for templated hinges.
 - A. Provide hinge width required to clear surrounding trim.
 - 2.2.1.3. Continuous Hinges: Comply with BHMA A156.26.
 - 2.2.1.4. Provide hinges on every swinging door.
 - 2.2.1.5. Provide five-knuckle full mortise butt hinges unless otherwise indicated.
 - 2.2.1.6. Provide ball-bearing hinges at each door with closer.
 - 2.2.1.7. Provide non-removable pins on exterior outswinging doors.
 - 2.2.1.8. Provide following quantity of butt hinges for each door:
 - A. Doors up to 60 inches High: Two hinges.
 - B. Doors From 60 inches High up to 90 inches High: Three hinges.

- C. Doors over 120 inches High: One additional hinge per each additional 30 inches in height.
- D. Dutch Doors: Two hinges each leaf.

2.3. EXIT DEVICES

- 2.3.1. Manufacturers:
 - 2.3.1.1. Von Duprin, an Allegion brand: www.allegion.com/us/#sle.
 - 2.3.1.2. Any product equal and approved.
 - 2.3.1.3. Substitutions: See Section 01 60 00 - Product Requirements.
- 2.3.2. Exit Devices: Comply with BHMA A156.3, Grade 2.
 - 2.3.2.1. Lever design to match lockset trim.
 - 2.3.2.2. Provide cylinder with cylinder dogging or locking trim.
 - 2.3.2.3. Provide exit devices properly sized for door width and height.
 - 2.3.2.4. Provide strike as recommended by manufacturer for application indicated.
 - 2.3.2.5. Provide UL (DIR) listed exit device assemblies for fire-rated doors and panic device assemblies for non-fire-rated doors.

2.4. ELECTRIC STRIKES

- 2.4.1. Electric Strikes: Comply with BHMA A156.31, Grade 1.
 - 2.4.1.1. Provide UL (DIR) listed burglary-resistant electric strike; style to suit locks.
 - 2.4.1.2. Provide non-handed 24 VDC electric strike suitable for door frame material and scheduled lock configuration.

2.5. LOCK CYLINDERS

- 2.5.1. Lock Cylinders: Provide key access on outside of each lock, unless otherwise indicated.
 - 2.5.1.1. Provide standard, electronic, conventional, full size interchangeable core (FSIC), and small format interchangeable core (SFIC) type cylinders, Grade 1, with six-pin core in compliance with BHMA A156.5 at locations indicated.
 - 2.5.1.2. Provide cylinders from same manufacturer as locking device.
 - 2.5.1.3. Provide cams and/or tailpieces as required for locking devices.

2.6. CYLINDRICAL LOCKS

- 2.6.1. Manufacturers:
 - 2.6.1.1. Schlage, an Allegion brand: www.allegion.com/us/#sle.
 - 2.6.1.2. Any product equal and approved.
 - 2.6.1.3. Substitutions: See Section 01 60 00 - Product Requirements.
- 2.6.2. Cylindrical Locks (Bored): Comply with BHMA A156.2, Grade 2, 4000 Series.
 - 2.6.2.1. Bored Hole: 2-1/8 inch diameter.
 - 2.6.2.2. Latchbolt Throw: 1/2 inch, minimum.
 - 2.6.2.3. Backset: 2-3/4 inch unless otherwise indicated.
 - 2.6.2.4. Strikes: Provide manufacturer's standard strike for each latchset or lockset with strike box and curved lip extending to protect frame in compliance with indicated requirements.
 - A. Finish: To match lock or latch.
 - B. Flat-Lip Strikes: Provide for locks with three piece antifriction latchbolts as recommended by manufacturer.
 - C. Extra-Long-Lip Strikes: Provide for locks used on frames with applied wood casing trim.

- D. Aluminum-Frame Strike Box: Provide strike box fabricated for use with aluminum framing by framing manufacturer.
 - E. Rabbet Front and Strike: Provide on locksets for use with rabbeted meeting rails.
- 2.6.2.5. Provide a lock for each door, unless otherwise indicated that lock is not required.

2.7. MORTISE LOCKS

- 2.7.1. Manufacturers:
 - 2.7.1.1. Schlage, an Allegion brand: www.allegion.com/us/#sle.
 - 2.7.1.2. Any product equal and approved.
 - 2.7.1.3. Substitutions: See Section 01 60 00 - Product Requirements.
- 2.7.2. Mortise Locks: Comply with BHMA A156.13, Grade 2, Security, 1000 Series.
 - 2.7.2.1. Latchbolt Throw: 3/4 inch, minimum.
 - 2.7.2.2. Deadbolt Throw: 1 inch, minimum.
 - 2.7.2.3. Backset: 2-3/4 inch unless otherwise indicated.
 - 2.7.2.4. Strikes: Provide manufacturer's standard strike for each latchset or lockset with strike box and curved lip extending to protect frame in compliance with indicated requirements.
 - A. Flat-Lip Strikes: Provide for locks with three piece antifriction latchbolts as recommended by manufacturer.
 - B. Extra-Long-Lip Strikes: Provide for locks used on frames with applied wood casing trim.
 - C. Aluminum-Frame Strike Box: Provide strike box fabricated for use with aluminum framing by framing manufacturer.
 - D. Rabbet Front and Strike: Provide on locksets for use with rabbeted meeting rails.
 - E. Finish: To match lock or latch.

2.8. COORDINATORS

- 2.8.1. Coordinators: Provide on doors having closers and self-latching or automatic flush bolts to ensure that inactive door leaf closes before active door leaf.
 - 2.8.1.1. Type: Bar, unless otherwise indicated.
 - 2.8.1.2. Material: Aluminum, unless otherwise indicated.
 - 2.8.1.3. Ensure that coordination of other door hardware affected by placement of coordinators and carry bar is applied properly for completely operable installation.

2.9. CLOSERS

- 2.9.1. Manufacturers; Surface Mounted:
 - 2.9.1.1. Hager Companies: www.hagerco.com/#sle.
 - 2.9.1.2. Any product equal and approved.
 - 2.9.1.3. Substitutions: See Section 01 60 00 - Product Requirements.
- 2.9.2. Closers: Comply with BHMA A156.4, Grade 2.
 - 2.9.2.1. Type: Surface mounted to door.
 - 2.9.2.2. Provide door closer on each exterior door.
 - 2.9.2.3. Provide door closer on each fire-rated and smoke-rated door.
 - A. Spring hinges are not an acceptable self-closing device, unless otherwise indicated.
 - 2.9.2.4. Where an overlapping astragal is included on pairs of swinging doors, provide coordinator to ensure door leaves close in proper order.
 - 2.9.2.5. At corridor entry doors, mount closer on room side of door.
 - 2.9.2.6. At outswinging exterior doors, mount closer on interior side of door.

2.10. PROTECTION PLATES

- 2.10.1. Protection Plates: Comply with BHMA A156.6.
- 2.10.2. Metal Properties: Stainless steel material.
 - 2.10.2.1. Metal, Standard Duty: Thickness 0.050 inch, minimum.
- 2.10.3. Edges: Beveled, on four sides unless otherwise indicated.
- 2.10.4. Fasteners: Countersunk screw fasteners.

2.11. KICK PLATES

- 2.11.1. Kick Plates: Provide along bottom edge of push side of every door with closer, except aluminum storefront and glass entry doors, unless otherwise indicated.
 - 2.11.1.1. Size: 8 inch high by 2 inch less door width (LDW) on push side of door.

2.12. FLOOR STOPS

- 2.12.1. Floor Stops: Comply with BHMA A156.16, Grade 2 and Resilient Material Retention Test as described in this standard.
 - 2.12.1.1. Provide floor stops when wall surface is not available; be cautious not to create a tripping hazard.
 - 2.12.1.2. Type: Manual hold-open, with pencil floor stop.
 - 2.12.1.3. Material: Aluminum housing with rubber insert.

2.13. WALL STOPS

- 2.13.1. Wall Stops: Comply with BHMA A156.16, Grade 2 and Resilient Material Retention Test as described in this standard.
 - 2.13.1.1. Provide wall stops to prevent damage to wall surface upon opening door.
 - 2.13.1.2. Type: Bumper, concave, wall stop.
 - 2.13.1.3. Material: Aluminum housing with rubber insert.

2.14. THRESHOLDS

- 2.14.1. Thresholds: Comply with BHMA A156.21.
 - 2.14.1.1. Provide threshold at interior doors for transition between two different floor types, and over building expansion joints, unless otherwise indicated.
 - 2.14.1.2. Provide threshold at each exterior door, unless otherwise indicated.
 - 2.14.1.3. Type: Flat surface.
 - 2.14.1.4. Material: Aluminum.
 - 2.14.1.5. Threshold Surface: Fluted horizontal grooves across full width.
 - 2.14.1.6. Field cut threshold to profile of frame and width of door sill for tight fit.
 - 2.14.1.7. Provide non-corroding fasteners at exterior locations.

2.15. WEATHERSTRIPPING AND GASKETING

- 2.15.1. Weatherstripping and Gasketing: Comply with BHMA A156.22.
 - 2.15.1.1. Head and Jamb Type: Adjustable.
 - 2.15.1.2. Door Sweep Type: Encased in retainer.
 - 2.15.1.3. Material: Aluminum, with brush weatherstripping.
 - 2.15.1.4. Provide weatherstripping on each exterior door at head, jambs, and meeting stiles of door pairs, unless otherwise indicated.
 - 2.15.1.5. Provide door bottom sweep on each exterior door, unless otherwise indicated.

2.16. FIRE DEPARTMENT LOCK BOX

- 2.16.1. Manufacturers:
 - 2.16.1.1. Knox Company; Knox-Box Rapid Entry System: www.knoxbox.com/#sle.
 - 2.16.1.2. Any product equal and approved.
- 2.16.2. Fire Department Lock Box:
 - 2.16.2.1. Heavy-duty, surface mounted, solid stainless-steel box with hinged door and interior gasket seal; single drill resistant lock with dust covers and tamper alarm.
 - 2.16.2.2. Capacity: Holds 10 keys.
 - 2.16.2.3. Finish: Manufacturer's standard dark bronze.

2.17. FINISHES

- 2.17.1. Finishes: Provide door hardware of same finish, unless otherwise indicated.
 - 2.17.1.1. Finish: To Match Existing; BHMA A156.18.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Verify that doors and frames are ready to receive this work; labeled, fire-rated doors and frames are properly installed, and dimensions are as indicated on shop drawings.

3.2. INSTALLATION

- 3.2.1. Install hardware in accordance with manufacturer's instructions and applicable codes.
- 3.2.2. Install hardware on fire-rated doors and frames in accordance with applicable codes and NFPA 80.
- 3.2.3. Use templates provided by hardware item manufacturer.
- 3.2.4. Do not install surface mounted items until application of finishes to substrate are fully completed.
- 3.2.5. Door Hardware Mounting Heights: Distance from finished floor to center line of hardware item. As indicated in following list; unless noted otherwise in Door Hardware Schedule or on drawings.
 - 3.2.5.1. For Wood Doors: Install in compliance with DHI WDHS.3 recommendations.
- 3.2.6. Set exterior door thresholds with full-width bead of elastomeric sealant at each point of contact with floor providing a continuous weather seal; anchor thresholds with stainless steel countersunk screws.

3.3. ADJUSTING

- 3.3.1. Adjust work under provisions of Section 01 70 00 - Execution and Closeout Requirements.
- 3.3.2. Adjust hardware for smooth operation.
- 3.3.3. Adjust gasketing for complete, continuous seal; replace if unable to make complete seal.

3.4. CLEANING

- 3.4.1. Clean finished hardware in accordance with manufacturer's written instructions after final adjustments have been made.
- 3.4.2. Clean adjacent surfaces soiled by hardware installation.
- 3.4.3. Replace items that cannot be cleaned to manufacturer's level of finish quality at no additional cost.

3.5. PROTECTION

- 3.5.1. Protect finished Work under provisions of Section 01 70 00 - Execution and Closeout Requirements.
- 3.5.2. Do not permit adjacent work to damage hardware or finish.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 08 91 00

LOUVERS

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Louvers, frames, and accessories.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 07 25 00 - Weather Barriers: Sealing frames to water-resistive barrier installed on adjacent construction.
- 1.2.2. Section 07 62 00 - Sheet Metal Flashing and Trim.
- 1.2.3. Section 07 92 00 - Joint Sealants: Sealing joints between frames and adjacent construction.
- 1.2.4. Section 09 91 13 - Exterior Painting: Field painting.

1.3. REFERENCE STANDARDS

- 1.3.1. AAMA 611 - Specification for Anodized Architectural Aluminum; 2024.
- 1.3.2. AAMA 612 - Voluntary Specification, Performance Requirements, and Test Procedures for Combined Coatings of Anodic Oxide and Transparent Organic Coatings on Architectural Aluminum; 2020, with Errata (2022).
- 1.3.3. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.
- 1.3.4. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.
- 1.3.5. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.
- 1.3.6. AMCA 500-L - Laboratory Methods of Testing Louvers for Rating; 2023.
- 1.3.7. AMCA 511 - Certified Ratings Program Product Rating Manual for Air Control Devices; 2021, with Editorial Revision (2022).
- 1.3.8. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025.
- 1.3.9. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.
- 1.3.10. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.
- 1.3.11. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.
- 1.3.12. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.
- 1.3.13. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.

1.4. SUBMITTALS

- 1.4.1. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- 1.4.2. Product Data: Provide data describing design characteristics, maximum recommended air velocity, design free area, materials and finishes.
- 1.4.3. Shop Drawings: Indicate louver layout plan and elevations, opening and clearance dimensions, and tolerances; head, jamb and sill details; blade configuration, screens, blank-off areas required, and frames.
- 1.4.4. Test Reports: Independent agency reports showing compliance with specified performance criteria.

1.5. QUALITY ASSURANCE

- 1.5.1. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with minimum five years of documented experience.

1.6. WARRANTY

- 1.6.1. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- 1.6.2. Provide five year manufacturer's warranty against distortion, metal degradation, and connection failures of louver components.

2. PART 2 PRODUCTS

2.1. MANUFACTURERS

- 2.1.1. Louvers:
 - 2.1.1.1. Airline Louvers: www.airlinelouvers.com/#sle.
 - 2.1.1.2. Airolite Company, LLC: www.airolite.com/#sle.
 - 2.1.1.3. Industrial Louvers, Inc: www.industriallouvers.com/#sle.
 - 2.1.1.4. Ruskin Company; Louvers: www.ruskin.com/#sle.
 - 2.1.1.5. Substitutions: See Section 01 60 00 - Product Requirements.

2.2. LOUVERS

- 2.2.1. Louvers: Factory fabricated and assembled, complete with frame, mullions, and accessories; AMCA Certified in accordance with AMCA 511.
 - 2.2.1.1. Wind Load Resistance: Design to resist positive and negative wind load as required by code without damage or permanent deformation.
 - 2.2.1.2. Intake Louvers: Design to allow maximum of 0.01 oz/sq ft water penetration at calculated intake design velocity based on design air flow and actual free area, when tested in accordance with AMCA 500-L.
 - 2.2.1.3. Drainable Blades: Continuous rain stop at front or rear of blade aligned with vertical gutter recessed into both jambs of frame.
 - 2.2.1.4. Screens: Provide insect screens at intake louvers and bird screens at exhaust louvers.

2.3. MATERIALS

- 2.3.1. Extruded Aluminum: ASTM B221 (ASTM B221M).
- 2.3.2. Steel Sheet: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating.
- 2.3.3. Stainless Steel: ASTM A666/A666M, Type 304, soft temper, smooth surface, No. 4 brushed finish.

2.4. FINISHES

- 2.4.1. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils thick.
- 2.4.2. High Performance Organic Coatings: AAMA 2604; multiple coats, thermally cured fluoropolymer system.

2.5. ACCESSORIES

- 2.5.1. Screens: Frame of same material as louver, with reinforced corners; removable, screw attached; installed on inside face of louver frame.
- 2.5.2. Bird Screen: Interwoven wire mesh of steel, 14 gauge, 0.0641 inch diameter wire, 1/2 inch open weave, diagonal design.
- 2.5.3. Insect Screen: 18 x 16 size aluminum mesh.
- 2.5.4. Fasteners and Anchors: Galvanized steel.
- 2.5.5. Flashings: Of same material as louver frame, formed to required shape, single length in one piece per location.
- 2.5.6. Sealant for Setting Sills and Sill Flashing: Non-curing butyl type.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Verify that prepared openings and flashings are ready to receive this work and opening dimensions are as indicated on shop drawings.

3.2. INSTALLATION

- 3.2.1. Install louver assembly in accordance with manufacturer's instructions.
- 3.2.2. Install louvers level and plumb.
- 3.2.3. Set sill members and sill flashing in continuous bead of sealant.
- 3.2.4. Install flashings and align louver assembly to ensure moisture shed from flashings and diversion of moisture to exterior.
- 3.2.5. Secure louver frames in openings with concealed fasteners.
- 3.2.6. Coordinate with installation of mechanical ductwork.

3.3. ADJUSTING

- 3.3.1. Adjust operable louvers for freedom of movement of control mechanism. Lubricate operating joints.

3.4. CLEANING

- 3.4.1. Strip protective finish coverings.
- 3.4.2. Clean surfaces and components.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 09 03 00

CONSERVATION TREATMENT OF PERIOD FINISHES

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Gypsum plastering.
- 1.1.2. Plaster repair.
- 1.1.3. Painting.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 09 91 23 - Interior Painting.

1.3. REFERENCE STANDARDS

- 1.3.1. ASTM C28/C28M - Standard Specification for Gypsum Plasters; 2010 (Reapproved 2020).
- 1.3.2. ASTM C35 - Standard Specification for Inorganic Aggregates for Use in Gypsum Plaster; 2001 (Reapproved 2019).
- 1.3.3. ASTM C59/C59M - Standard Specification for Gypsum Casting Plaster and Gypsum Molding Plaster; 2000 (Reapproved 2020).
- 1.3.4. ASTM C206 - Standard Specification for Finishing Hydrated Lime; 2014 (Reapproved 2022).
- 1.3.5. ASTM C631 - Standard Specification for Bonding Compounds for Interior Gypsum Plastering; 2009 (Reapproved 2020).
- 1.3.6. ASTM C841 - Standard Specification for Installation of Interior Lathing and Furring; 2023.
- 1.3.7. ASTM C842 - Standard Specification for Application of Interior Gypsum Plaster; 2005 (Reapproved 2025).
- 1.3.8. ASTM C1355/C1355M - Standard Specification for Glass Fiber Reinforced Gypsum Composites; 2025.
- 1.3.9. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2024.
- 1.3.10. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- 1.3.11. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.

1.4. DELIVERY, STORAGE, AND HANDLING

- 1.4.1. Deliver materials in original and unopened packaging, with brand names and manufacturer's labels intact and legible.
- 1.4.2. Store materials in dry location, fully protected from weather and direct exposure to sunlight.

1.5. FIELD CONDITIONS

- 1.5.1. Maintain temperature between 50 degrees F and 80 degrees F for not less than one week prior to applying plaster and continuously after applying plaster.
- 1.5.2. Maintain adequate ventilation to remove excess water while plaster dries.

2. PART 2 PRODUCTS

3. PART 3 EXECUTION

3.1. PERIOD TREATMENT, GENERAL

3.2. EXAMINATION

- 3.2.1. Verify existing conditions are satisfactory before starting work.
- 3.2.2. Plastering Substrates:
 - 3.2.2.1. Lath: Verify lath is flat, secured to substrate, and joint and surface perimeter accessories are in place.

3.3. PREPARATION

- 3.3.1. General: Remove and salvage elements and hardware for reinstallation; tag and protect surface-mounted items.
- 3.3.2. Install temporary protection measures.
- 3.3.3. Removal of Existing Damaged Plaster: Remove only portions indicated to be repaired or replaced.

3.4. FLAT PLASTERING

- 3.4.1. Apply gypsum plaster in accordance with ASTM C842 and manufacturer's instructions.
- 3.4.2. Thickness of Plaster including Finish Coat:
 - 3.4.2.1. Over wood lath: 3/4 inch.
- 3.4.3. Finish Texture: Float to a consistent and smooth finish.

3.5. TOLERANCES

- 3.5.1. Maximum Variation from True Flatness: 1/8 inch in 10 feet.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 09 21 16

GYPSUM BOARD ASSEMBLIES

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Performance criteria for gypsum board assemblies.
- 1.1.2. Acoustic insulation.
- 1.1.3. Cementitious backing board.
- 1.1.4. Gypsum wallboard.
- 1.1.5. Joint treatment and accessories.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- 1.2.2. Section 06 10 00 - Rough Carpentry: Wood blocking product and execution requirements.

1.3. REFERENCE STANDARDS

- 1.3.1. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2023.
- 1.3.2. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 2023.
- 1.3.3. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2017 (Reapproved 2022).
- 1.3.4. ASTM C557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing; 2003 (Reapproved 2017).
- 1.3.5. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2024.
- 1.3.6. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2025.
- 1.3.7. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2022.
- 1.3.8. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base; 2019.
- 1.3.9. ASTM C1325 - Standard Specification for Fiber-Mat Reinforced Cementitious Backer Units; 2025.
- 1.3.10. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2024.
- 1.3.11. ASTM C1658/C1658M - Standard Specification for Glass Mat Gypsum Panels; 2019 (Reapproved 2024).
- 1.3.12. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.
- 1.3.13. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.
- 1.3.14. ASTM E413 - Classification for Rating Sound Insulation; 2022.
- 1.3.15. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems; 2024.
- 1.3.16. GA-216 - Application and Finishing of Gypsum Panel Products; 2024.
- 1.3.17. GA-600 - Fire Resistance and Sound Control Design Manual; 2024.
- 1.3.18. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

- 1.3.19. UL (DIR) - Online Certifications Directory; Current Edition.
- 1.3.20. UL (FRD) - Fire Resistance Directory; Current Edition.
- 1.3.21. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.
- 1.3.22. UL 2079 - Standard for Tests for Fire Resistance of Building Joint Systems; Current Edition, Including All Revisions.

1.4. ADMINISTRATIVE REQUIREMENTS

- 1.4.1. Coordination: Coordinate the installation of gypsum board assemblies with size, location, and installation of service utilities.

1.5. SUBMITTALS

- 1.5.1. Product Data:
 - 1.5.1.1. Provide data on gypsum board, accessories, and joint finishing system.

1.6. DELIVERY, STORAGE, AND HANDLING

- 1.6.1. Store gypsum products and accessories indoors and keep above freezing. Elevate boards above floor, on nonwicking supports, in accordance with manufacturer's recommendations.
- 1.6.2. Store metal products to prevent corrosion.

2. PART 2 PRODUCTS

2.1. GYPSUM BOARD ASSEMBLIES

- 2.1.1. Provide completed assemblies complying with ASTM C840 and GA-216.
- 2.1.2. Interior Partitions, Indicated as Acoustic: Provide completed assemblies with the following characteristics:
 - 2.1.2.1. Acoustic Attenuation: STC of 45-49 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.
- 2.1.3. Fire-Resistance-Rated Assemblies: Provide completed assemblies with the following characteristics:
 - 2.1.3.1. Fire-Resistance-Rated Partitions: 1 Hour Rating.

2.2. BOARD MATERIALS

- 2.2.1. Manufacturers - Gypsum-Based Board:
 - 2.2.1.1. American Gypsum Company: www.americangypsum.com/#sle.
 - 2.2.1.2. CertainTeed Corporation: www.certainteed.com/#sle.
 - 2.2.1.3. Georgia-Pacific Gypsum: www.gpgypsum.com/#sle.
 - 2.2.1.4. USG Corporation: www.usg.com/#sle.
 - 2.2.1.5. Any product equal and approved.
- 2.2.2. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
 - 2.2.2.1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
 - 2.2.2.2. Glass mat faced gypsum panels, as defined in ASTM C1658/C1658M, suitable for paint finish, of the same core type and thickness may be substituted for paper-faced board.
 - 2.2.2.3. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 - A. Mold-resistant board is required whenever board is being installed before the building is enclosed and conditioned.
 - B. Mold resistant board is required in all damp locations and behind all plumbing fixtures..

- 2.2.2.4. At Assemblies Indicated with Fire-Resistance Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
- 2.2.2.5. Thickness:
 - A. Vertical Surfaces: 5/8 inch.
 - B. Ceilings: 5/8 inch.
 - C. Multi-Layer Assemblies: Thicknesses as indicated on drawings.
- 2.2.2.6. Mold-Resistant, Paper-Faced Products:
 - A. American Gypsum Company; M-Bloc: www.americangypsum.com/#sle.
 - B. American Gypsum Company; M-Bloc Type X: www.americangypsum.com/#sle.
 - C. CertainTeed Corporation; M2Tech 1/2" Moisture & Mold Resistant Drywall: www.certainteed.com/#sle.
 - D. CertainTeed Corporation; M2Tech 5/8" Type X Moisture & Mold Resistant Drywall: www.certainteed.com/#sle.
 - E. Georgia-Pacific Gypsum; ToughRock Mold-Guard: www.gpgypsum.com/#sle.
 - F. Georgia-Pacific Gypsum; ToughRock Fireguard X Mold-Guard: www.gpgypsum.com/#sle.
 - G. USG Corporation; Sheetrock Brand EcoSmart Panels Mold Tough Firecode X 5/8 in. (15.9 mm): www.usg.com/#sle.
 - H. USG Corporation; Sheetrock Brand Mold Tough Firecode SCX Panels 5/8 in. (15.9 mm): www.usg.com/#sle.
 - I. Any product equal and approved.
 - J. Substitutions: See Section 01 60 00 - Product Requirements.
- 2.2.3. Backing Board For Wet Areas: One of the following products:
 - 2.2.3.1. Application: Surfaces behind tile in wet areas, including tub and shower surrounds and shower ceilings.
 - 2.2.3.2. Application: Horizontal surfaces behind tile in wet areas including countertops.
 - 2.2.3.3. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 - 2.2.3.4. ANSI Cement-Based Board: Non-gypsum-based; aggregated Portland cement panels with glass fiber mesh embedded in front and back surfaces complying with ANSI A118.9 or ASTM C1325.
 - A. Thickness: 1/2 inch.
 - B. Products:
 - A) USG Corporation; Fiberock Brand Aqua-Tough AR Interior Panels Regular 1/2 in. (12.7 mm): www.usg.com/#sle.
 - B) USG Corporation; Fiberock Brand Aqua-Tough AR Interior Panels Regular 5/8 in. (15.9 mm): www.usg.com/#sle.
 - C) Any product equal and approved.
 - D) Substitutions: See Section 01 60 00 - Product Requirements.
- 2.2.4. Ceiling Board: Special sag resistant gypsum ceiling board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
 - 2.2.4.1. Application: Ceilings, unless otherwise indicated.
 - 2.2.4.2. Thickness: 1/2 inch.
 - 2.2.4.3. Edges: Tapered.

2.3. GYPSUM BOARD ACCESSORIES

- 2.3.1. Acoustic Insulation: ASTM C665; preformed mineral-fiber, friction fit type, unfaced; thickness as required for STC.
 - 2.3.2. Finishing Accessories: ASTM C1047, extruded aluminum alloy (6063 T5) or galvanized steel sheet ASTM A924/A924M G90, unless noted otherwise.
 - 2.3.2.1. Types: As detailed or required for finished appearance.
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- 2.3.2.2. Special Shapes: In addition to conventional corner bead and control joints, provide U-bead at exposed panel edges.
- 2.3.3. Moisture Guard Trim: ASTM C1047, rigid plastic, 48 inch length, applied to bottom edge of gypsum board throughout building.
- 2.3.4. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
 - 2.3.4.1. Paper Tape: 2 inch wide, creased paper tape for joints and corners, except as otherwise indicated.
 - 2.3.4.2. Joint Compound: Drying type, vinyl-based, ready-mixed.
- 2.3.5. Finishing Compound: Surface coat and primer, takes the place of skim coating.
- 2.3.6. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inches in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion-resistant.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Verify that project conditions are appropriate for work of this section to commence.

3.2. FRAMING INSTALLATION

- 3.2.1. Suspended Ceilings and Soffits: Space framing and furring members as indicated.
 - 3.2.1.1. Level ceiling system to a tolerance of 1/1200.
- 3.2.2. Studs: Space studs at 16 inches on center.
 - 3.2.2.1. Extend partition framing to structure where indicated and to ceiling in other locations.
 - 3.2.2.2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.
 - 3.2.2.3. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.
- 3.2.3. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.
- 3.2.4. Furring for Fire-Resistance Ratings: Install as required for fire-resistance ratings indicated and to GA-600 requirements.
- 3.2.5. Blocking: Install wood blocking for support of:
 - 3.2.5.1. Framed openings.
 - 3.2.5.2. Wall-mounted cabinets.
 - 3.2.5.3. Plumbing fixtures.
 - 3.2.5.4. Toilet accessories.
 - 3.2.5.5. Wall-mounted door hardware.

3.3. ACOUSTIC ACCESSORIES INSTALLATION

- 3.3.1. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.
- 3.3.2. Acoustic Sealant: Install in accordance with manufacturer's instructions.
 - 3.3.2.1. Place one bead continuously on substrate before installation of perimeter framing members.
 - 3.3.2.2. Place continuous bead at perimeter of each layer of gypsum board.

- 3.3.2.3. Seal around all penetrations by conduit, pipe, ducts, and rough-in boxes, except where firestopping is provided.

3.4. BOARD INSTALLATION

- 3.4.1. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.
- 3.4.2. Single-Layer Nonrated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
 - 3.4.2.1. Exception: Tapered edges to receive joint treatment at right angles to framing.
- 3.4.3. Fire-Resistance-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.
- 3.4.4. Exposed Gypsum Board in Interior Wet Areas: Seal joints, cut edges, and holes with water-resistant sealant.
- 3.4.5. Cementitious Backing Board: Install over steel framing members and plywood substrate where indicated, in accordance with ANSI A108.11 and manufacturer's instructions.
- 3.4.6. Installation on Wood Framing: For rated assemblies, comply with requirements of listing authority. For nonrated assemblies, install as follows:
 - 3.4.6.1. Single-Layer Applications: Screw attachment.
 - 3.4.6.2. Double-Layer Application: Install base layer using screws or nails. Install face layer using adhesive.

3.5. INSTALLATION OF TRIM AND ACCESSORIES

- 3.5.1. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
 - 3.5.1.1. Not more than 30 feet apart on walls and ceilings over 50 feet long.
 - 3.5.1.2. At exterior soffits, not more than 30 feet apart in both directions.
- 3.5.2. Corner Beads: Install at external corners, using longest practical lengths.
- 3.5.3. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.
- 3.5.4. Moisture Guard Trim: Install on bottom edge of gypsum board throughout building.

3.6. JOINT TREATMENT

- 3.6.1. Paper Faced Gypsum Board: Use paper joint tape, embed with drying type joint compound and finish with drying type joint compound.
- 3.6.2. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
 - 3.6.2.1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
 - 3.6.2.2. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
 - 3.6.2.3. Level 1: Fire-resistance-rated wall areas above finished ceilings, whether or not accessible in the completed construction.
- 3.6.3. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
 - 3.6.3.1. Feather coats of joint compound so that camber is maximum 1/32 inch.
 - 3.6.3.2. Taping, filling, and sanding are not required at surfaces behind adhesive applied ceramic tile and fixed cabinetry.
 - 3.6.3.3. Taping, filling, and sanding are not required at base layer of double-layer applications.
- 3.6.4. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

3.7. TOLERANCES

- 3.7.1. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

3.8. CLEANING

- 3.8.1. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements.

3.9. PROTECTION

- 3.9.1. Protect installed gypsum board assemblies from subsequent construction operations.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 09 30 00

TILING

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Tile for floor applications.
- 1.1.2. Tile for wall applications.
- 1.1.3. Cementitious backer board as tile substrate.
- 1.1.4. Ceramic accessories.
- 1.1.5. Ceramic trim.
- 1.1.6. Non-ceramic trim.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 09 21 16 - Gypsum Board Assemblies: Tile backer board.

1.3. REFERENCE STANDARDS

- 1.3.1. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2023.
- 1.3.1. ANSI A108/A118/A136 - American National Standard Specifications for the Installation of Ceramic Tile (Compendium); 2024.
- 1.3.2. ANSI A118.3 - American National Standard Specifications for Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive; 2021.
- 1.3.3. ANSI A118.6 - American National Standard Specifications for Standard Cement Grouts for Tile Installation; 2019.
- 1.3.4. ANSI A118.7 - American National Standard Specifications for High Performance Cement Grouts for Tile Installation; 2019.
- 1.3.5. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 2023.
- 1.3.6. ANSI A118.10 - American National Standard Specifications for Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation; 2023.
- 1.3.7. ANSI A118.12 - American National Standard Specifications for Crack Isolation Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation; 2014 (Reaffirmed 2024).
- 1.3.8. ANSI A118.13 - American National Standard Specification for Bonded Sound Reduction Membranes for Thin-Set Ceramic Tile Installation; 2014 (Reaffirmed 2024).
- 1.3.9. ANSI A137.1 - American National Standard Specifications for Ceramic Tile; 2022.
- 1.3.10. ANSI A326.3 - American National Standard Test Method for Measuring Dynamic Coefficient of Friction of Hard Surface Flooring Materials; 2021.
- 1.3.11. ASTM C373 - Standard Test Methods for Determination of Water Absorption and Associated Properties by Vacuum Method for Pressed Ceramic Tiles and Glass Tiles and Boil Method for Extruded Ceramic Tiles and Non-tile Fired Ceramic Whiteware Products; 2018 (Reapproved 2023).
- 1.3.12. ASTM E492 - Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine; 2025.
- 1.3.13. ASTM E2179 - Standard Test Method for Laboratory Measurement of the Effectiveness of Floor Coverings in Reducing Impact Sound Transmission Through Concrete Floors; 2025.

- 1.3.14. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2022.
- 1.3.15. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2023.
- 1.3.16. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.
- 1.3.17. TCNA (HB-GP) - Handbook for Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs Installation; 2023.
- 1.3.18. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2025.

1.4. SUBMITTALS

- 1.4.1. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- 1.4.2. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.

1.5. QUALITY ASSURANCE

- 1.5.1. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum ten years of documented experience.

1.6. DELIVERY, STORAGE, AND HANDLING

- 1.6.1. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.7. FIELD CONDITIONS

- 1.7.1. Do not install solvent-based products in an unventilated environment.
- 1.7.2. Maintain ambient and substrate temperature above 50 degrees F and below 100 degrees F during installation and curing of setting materials.

2. PART 2 PRODUCTS

2.1. MANUFACTURERS

- 2.1.1. Tile:
 - 2.1.1.1. American Olean Corporation: www.americanolean.com/#sle.
 - 2.1.1.2. Dal-Tile Corporation: www.daltile.com/#sle.
 - 2.1.1.3. Any product equal and approved.
 - 2.1.1.4. Substitutions: See Section 01 60 00 - Product Requirements.
 - 2.1.1.5. Source Limitations: Furnish products produced by single manufacturer and obtained from single supplier.
- 2.1.2. Setting Materials:
 - 2.1.2.1. ARDEX Engineered Cements: www.ardexamericas.com/#sle.
 - 2.1.2.2. Bostik Inc: www.bostik.com/#sle.
 - 2.1.2.3. LATICRETE International, Inc: www.laticrete.com/#sle.
 - 2.1.2.4. Schluter-Systems: www.schluter.com/#sle.
 - 2.1.2.5. Any product equal and approved.
 - 2.1.2.6. Source Limitations: Furnish products produced by single manufacturer and obtained from single supplier.
- 2.1.3. Grout:
 - 2.1.3.1. ARDEX Engineered Cements: www.ardexamericas.com/#sle.
 - 2.1.3.2. Bostik Inc: www.bostik.com/#sle.
 - 2.1.3.3. LATICRETE International, Inc: www.laticrete.com/#sle.
 - 2.1.3.4. Any product equal and approved.

- 2.1.3.5. Source Limitations: Furnish products produced by single manufacturer and obtained from single supplier.

2.2. PERFORMANCE REQUIREMENTS

- 2.2.1. Floor Tile: Provide tile for flooring applications with minimum wet Dynamic Coefficient of Friction (DCOF) of 0.42 when tested in accordance with ANSI A326.3.

2.3. TILE

- 2.3.1. Glazed Wall Tile: ANSI A137.1 standard grade.
 - 2.3.1.1. Moisture Absorption: 7.0 to 20.0 percent as tested in accordance with ASTM C373.
 - 2.3.1.2. Size: 4-1/4 by 4-1/4 inch, nominal.
 - 2.3.1.3. Color: As selected by Alba Architects from manufacturer's standard range.
 - 2.3.1.4. Pattern: To be determined.
 - 2.3.1.5. Trim Units: Matching bead, bullnose, cove, and base shapes in sizes coordinated with field tile.
- 2.3.2. Quarry Tile: ANSI A137.1 standard grade.
 - 2.3.2.1. Moisture Absorption: Over 3.0 but not more than 5.0 percent as tested in accordance with ASTM C373.
 - 2.3.2.2. Size: 8 by 8 inch, nominal.
 - 2.3.2.3. Thickness: 1/2 inch, nominal.
 - 2.3.2.4. Edges: Cushioned.
 - 2.3.2.5. Surface Finish: Non-slip.
 - 2.3.2.6. Color: As selected by Alba Architects from manufacturer's standard range.
 - 2.3.2.7. Pattern: To be determined.
 - 2.3.2.8. Trim Units: Matching bullnose, cove, cove base, and window sill or step nosing shapes in sizes coordinated with field tile.
- 2.3.3. Porcelain Tile: ANSI A137.1 standard grade.
 - 2.3.3.1. Color: As selected by Alba Architects from manufacturer's standard range.
 - 2.3.3.2. Pattern: To be determined.
 - 2.3.3.3. Trim Units: Matching bullnose, cove base, and cove shapes in sizes coordinated with field tile.

2.4. TRIM AND ACCESSORIES

- 2.4.1. Ceramic Accessories: Glazed finish, same color and finish as adjacent field tile; same manufacturer as tile.
- 2.4.2. Pre-Formed Accessories To Be Covered with Tile: High density expanded polystyrene with ANSI A118.10 waterproofing finish or membrane.
 - 2.4.2.1. Products:
 - A. LATICRETE International, Inc; LATICRETE HYDRO BAN Preformed Shower Systems: www.laticrete.com/#sle.
 - B. Schluter-Systems; KERDI: www.schluter.com/#sle.
 - C. Any product equal and approved.
- 2.4.3. Ceramic Trim: Matching bullnose, double bullnose, cove base, and cove ceramic shapes in sizes coordinated with field tile.
 - 2.4.3.1. Manufacturers: Same as for tile.
- 2.4.4. Non-Ceramic Trim: Satin brass anodized extruded aluminum, style and dimensions to suit application, set with tile mortar or adhesive.
 - 2.4.4.1. Applications:
 - A. Open edges of wall and floor tile.
 - B. Inside and outside wall corners.

- C. Transition between floor finishes of different heights.
- D. Thresholds at door openings.
- E. Floor and wall expansion and control joints.
- F. Floor-to-wall joints.
- G. Borders and other trim as indicated on drawings.
- H. Balcony and terrace edge trim and fascia.

2.4.4.2. Products:

- A. Schluter-Systems; Schiene: www.schluter.com/#sle.
- B. Any product equal and approved.

- 2.4.5. Thresholds: 2 inches wide by full width of wall or frame opening; beveled edge on both long edges; without holes, cracks, or open seams.

2.5. SETTING MATERIALS

- 2.5.1. Provide setting and grout materials from same manufacturer.

2.6. GROUTS

- 2.6.1. Provide setting and grout materials from same manufacturer.
- 2.6.2. High Performance Polymer Modified Grout: ANSI A118.7 polymer modified cement grout.
- 2.6.2.1. Applications: Use where indicated on drawings and where no other type of grout is indicated.
 - 2.6.2.2. Use sanded grout for joints 1/8 inch wide and larger; use unsanded grout for joints less than 1/8 inch wide.
 - 2.6.2.3. Color: As selected by Alba Architects from manufacturer's full line.
- 2.6.3. Standard Grout: ANSI A118.6 standard cement grout.
- 2.6.3.1. Applications: Use where indicated on drawings and where no other type of grout is indicated.
 - 2.6.3.2. Use sanded grout for joints 1/8 inch wide and larger; use unsanded grout for joints less than 1/8 inch wide.
 - 2.6.3.3. Color: As selected by Alba Architects from manufacturer's full line.
- 2.6.4. Epoxy Grout: ANSI A118.3 chemical resistant and water-cleanable epoxy grout.
- 2.6.4.1. Applications: Use where indicated on drawings.
 - 2.6.4.2. Color: As selected by Alba Architects from manufacturer's full line.

2.7. MAINTENANCE MATERIALS

- 2.7.1. Tile Sealant: Gunnable, silicone, siliconized acrylic, modified silane polymer, or urethane sealant; moisture- and mildew-resistant type.
- 2.7.1.1. Applications: Between tile and plumbing fixtures.
 - 2.7.1.2. Color: As selected by Alba Architects from manufacturer's full line.

2.8. ACCESSORY MATERIALS

- 2.8.1. Concrete Floor Slab Crack Isolation Membrane: Material complying with ANSI A118.12; not intended as waterproofing.
- 2.8.1.1. Crack Resistance: No failure at 1/8 inch gap, minimum.
- 2.8.2. Waterproofing Membrane at Floors: Specifically designed for bonding to cementitious substrate under thick mortar bed or thin-set tile; complying with ANSI A118.10.
- 2.8.2.1. Crack Resistance: No failure at 1/16-inch gap, minimum; comply with ANSI A118.12.
- 2.8.3. Reinforcing Mesh: 2 by 2 inch size weave of 16/16 wire size; welded fabric, galvanized.
- 2.8.4. Waterproofing Membrane Reinforcement: Polyester reinforcing fabric for use with fluid-applied waterproofing membrane.

- 2.8.5. Waterproofing Tape: Rubber tape for reinforcing and sealing joints in sheet waterproofing membranes.
- 2.8.6. Reinforcing Underlayment: Specifically designed for bonding to thin-set setting mortar; not primarily waterproofing material and having the following characteristics:
 - 2.8.6.1. Sound Reduction: Comply with ANSI A118.13, ASTM E492, and ASTM E2179.
 - 2.8.6.2. Crack Resistance: No failure at 1/16-inch gap, minimum; comply with ANSI A118.12.
 - 2.8.6.3. Water Resistance: Comply with ANSI A118.10, bonded waterproofing.
 - 2.8.6.4. Uncoupling Function: Allow for separation between membrane and mortar adhering tile to membrane when subjected to excessive substrate movement.
- 2.8.7. Reinforcing Underlayment: Specifically designed for bonding to thin-set setting mortar; not primarily waterproofing material and having the following characteristics:
 - 2.8.7.1. Material: Reinforced fiberglass mesh embedded between two layers of polypropylene fleece fabric.
 - 2.8.7.2. Thickness: 1/8 inch.
 - 2.8.7.3. Uncoupling Function: Allow for separation between membrane and mortar adhering tile to membrane when subjected to excessive substrate movement.
 - 2.8.7.4. Suitable for installation over green concrete.
 - 2.8.7.5. Type: Thin-set mortar adhered sheet.
- 2.8.8. Backer Board: Cementitious type complying with ANSI A118.9; high density, glass fiber reinforced, 7/16 inch thick; 2-inch wide coated glass fiber tape for joints and corners.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Verify subfloor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive tile.
- 3.1.2. Verify wall surfaces are smooth and flat within tolerances specified for that type of work, are dust-free, and are ready to receive tile.
- 3.1.3. Verify that subfloor surfaces are dust free and free of substances that could impair bonding of setting materials to subfloor surfaces.
- 3.1.4. Cementitious Subfloor Surfaces: Verify that substrates are ready for tiling installation by testing for moisture and alkalinity (pH).
 - 3.1.4.1. Test as Follows:
 - A. Alkalinity (pH): ASTM F710.
 - B. Internal Relative Humidity: ASTM F2170.
 - C. Moisture Vapor Emission: ASTM F1869.
 - 3.1.4.2. Obtain instructions if test results are not within limits recommended by tiling material manufacturer and setting material manufacturer.
- 3.1.5. Verify that required floor-mounted utilities are in correct location.

3.2. PREPARATION

- 3.2.1. Vacuum clean surfaces and damp clean.
- 3.2.2. Seal substrate surface cracks with filler.
- 3.2.3. Install cementitious backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of setting material to feather edge.
- 3.2.4. Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer's instructions.

3.3. INSTALLATION - GENERAL

- 3.3.1. Install tile, thresholds, and stair treads and grout in accordance with applicable requirements of ANSI A108/A118/A136, manufacturer's instructions, and TCNA (HB) or TCNA (HB-GP) recommendations, as applicable.
- 3.3.2. Lay tile to pattern indicated on drawings. Do not interrupt tile pattern through openings.
- 3.3.3. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.
- 3.3.4. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.
- 3.3.5. Form internal angles square and external angles bullnosed.
- 3.3.6. Install ceramic accessories rigidly in prepared openings.
- 3.3.7. Install non-ceramic trim in accordance with manufacturer's instructions.
- 3.3.8. Install thresholds where indicated on drawings.
- 3.3.9. Sound tile after setting. Replace hollow sounding units.
- 3.3.10. Keep control and expansion joints free of mortar, grout, and adhesive.
- 3.3.11. Prior to grouting, allow installation to completely cure; minimum of 48 hours.
- 3.3.12. Grout tile joints unless otherwise indicated on drawings. Use standard grout unless otherwise indicated on drawings.
- 3.3.13. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

3.4. INSTALLATION - FLOORS - THIN-SET METHODS

- 3.4.1. Over interior concrete substrates, install in accordance with TCNA (HB) Method F113, dry-set or latex-Portland cement bond coat, on ground, with standard grout, unless otherwise indicated on drawings.
- 3.4.2. Over wood substrates, install in accordance with TCNA (HB) Method F142, with standard grout, unless otherwise indicated on drawings.
- 3.4.3. Over wood substrates with backer board underlayment, install in accordance with TCNA (HB) Method F144, for cementitious backer boards, with standard grout.

3.5. INSTALLATION - FLOORS - MORTAR BED METHODS

- 3.5.1. Over interior concrete substrates, install in accordance with TCNA (HB) Method F111, with cleavage membrane, unless otherwise indicated on drawings.
- 3.5.2. Cleavage Membrane: Lap edges and ends.
- 3.5.3. Waterproofing Membrane: Install as recommended by manufacturer and as specified in the section in which the product is specified.
- 3.5.4. Mortar Bed Thickness: 5/8 inch, unless otherwise indicated on drawings.

3.6. INSTALLATION - WALL TILE

- 3.6.1. Over cementitious backer units on studs, install in accordance with TCNA (HB) Method W244C, using membrane at toilet rooms and kitchens.

3.7. CLEANING

- 3.7.1. Clean tile and grout surfaces.

3.8. PROTECTION

3.8.1. Do not permit traffic over finished floor surface for 4 days after installation.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 09 65 00 RESILIENT FLOORING

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Resilient tile flooring.
- 1.1.2. Resilient stair accessories.
- 1.1.3. Installation accessories.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- 1.2.2. Section 03 30 00 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors to receive adhesive-applied resilient flooring.
- 1.2.3. Section 09 05 61 - Common Work Results for Flooring Preparation: Removal of existing floor coverings, cleaning, and preparation.

1.3. REFERENCE STANDARDS

- 1.3.1. ASTM D6329 - Standard Guide for Developing Methodology for Evaluating the Ability of Indoor Materials to Support Microbial Growth Using Static Environmental Chambers; 1998 (Reapproved 2023).
- 1.3.2. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.
- 1.3.3. ASTM E492 - Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine; 2025.
- 1.3.4. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2025a.
- 1.3.5. ASTM F1700 - Standard Specification for Solid Vinyl Floor in Modular Format such as Tile(s) or Plank(s); 2025.
- 1.3.6. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; 2023.

1.4. SUBMITTALS

- 1.4.1. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- 1.4.2. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.

1.5. QUALITY ASSURANCE

- 1.5.1. Manufacturer Qualifications: Company specializing in manufacturing specified flooring with minimum five years documented experience.
- 1.5.2. Installer Qualifications: Company specializing in installing specified flooring with minimum five years documented experience.

1.6. DELIVERY, STORAGE, AND HANDLING

- 1.6.1. Upon receipt, immediately remove any shrink-wrap and check materials for damage and the correct style, color, quantity and run numbers.
- 1.6.2. Store all materials off of the floor in an acclimatized, weather-tight space.
- 1.6.3. Maintain temperature in storage area between 55 degrees F and 90 degrees F.
- 1.6.4. Do not double stack pallets.

1.7. FIELD CONDITIONS

- 1.7.1. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

2. PART 2 PRODUCTS

2.1. TILE FLOORING

- 2.1.1. Luxury Vinyl Tile: Transparent or translucent wear layer; acoustic interlayer or backing.
 - 2.1.1.1. Manufacturers:
 - A. Mannington Commercial; Spacia: www.manningtoncommercial.com#sle.
 - B. Any product equal and approved.
 - C. Substitutions: See Section 01 60 00 - Product Requirements.
 - 2.1.1.2. Minimum Requirements: Comply with ASTM F1700, Class III.
 - 2.1.1.3. Impact Insulation Class (IIC): 57, minimum, when floor-ceiling assembly tested in accordance with ASTM E492.
 - 2.1.1.4. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E648.
 - 2.1.1.5. Mold and Microbial Resistance: Highly resistant when tested in accordance with ASTM D6329.
 - 2.1.1.6. Plank Tile Size: 8 by 40 inch.
 - 2.1.1.7. Tile Edge: Interlocking shape.
 - 2.1.1.8. Pattern: To be determined.
 - 2.1.1.9. Color: To be selected by Alba Architects from manufacturer's full range.

2.2. STAIR COVERING

- 2.2.1. Stair Treads: Rubber; full width and depth of stair tread in one piece; tapered thickness.
 - 2.2.1.1. Manufacturers:
 - A. Mannington Commercial: www.manningtoncommercial.com#sle.
 - B. Roppe Corporation; Rubber Stair Treads: www.roppe.com/#sle.
 - C. Any product equal and approved.
 - D. Substitutions: See Section 01 60 00 - Product Requirements.
 - 2.2.1.2. Nosing: Square.
 - 2.2.1.3. Striping: 2 inch wide contrasting color abrasive strips.
 - 2.2.1.4. Texture: Raised.
 - 2.2.1.5. Color: To be selected by Alba Architects from manufacturer's full range.
- 2.2.2. Stair Risers: Full height and width of tread in one piece, matching treads in material and color.
 - 2.2.2.1. Thickness: 0.080 inch.

2.3. ACCESSORIES

- 2.3.1. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.

- 2.3.2. Primers, Adhesives, and Seam Sealer: Waterproof; types recommended by flooring manufacturer.
- 2.3.3. Moldings, Transition and Edge Strips: Same material as flooring.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.
- 3.1.2. Cementitious Subfloor Surfaces: Verify that substrates are ready for resilient flooring installation by testing for moisture and alkalinity (pH).
 - 3.1.2.1. Test in accordance with Section 09 05 61.
 - 3.1.2.2. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.
- 3.1.3. Verify that required floor-mounted utilities are in correct location.

3.2. PREPARATION

- 3.2.1. Remove subfloor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with subfloor filler to achieve smooth, flat, hard surface.
- 3.2.2. Prohibit traffic until filler is fully cured.
- 3.2.3. Clean substrate.

3.3. INSTALLATION - GENERAL

- 3.3.1. Starting installation constitutes acceptance of subfloor conditions.
- 3.3.2. Install in accordance with manufacturer's written instructions.
- 3.3.3. Loose-Laid Installation: Set flooring in place in accordance with manufacturer's instructions.
- 3.3.4. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.
- 3.3.5. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.
- 3.3.6. Install flooring in recessed floor access covers, maintaining floor pattern.

3.4. INSTALLATION - TILE FLOORING

- 3.4.1. Mix tile from container to ensure shade variations are consistent when tile is placed, unless otherwise indicated in manufacturer's installation instructions.
- 3.4.2. Lay flooring with joints and seams parallel to building lines to produce symmetrical pattern.
- 3.4.3. Install plank tile with a random offset of at least 6 inches from adjacent rows.

3.5. INSTALLATION - STAIR COVERINGS

- 3.5.1. Adhere over entire surface. Fit accurately and securely.

3.6. CLEANING

- 3.6.1. Remove excess adhesive from floor, base, and wall surfaces without damage.
- 3.6.2. Clean in accordance with manufacturer's written instructions.

3.7. PROTECTION

- 3.7.1. Prohibit traffic on resilient flooring for 48 hours after installation.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 09 91 13

EXTERIOR PAINTING

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Surface preparation.
- 1.1.2. Field application of paints.
- 1.1.3. Scope: Finish exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
- 1.1.4. Do Not Paint or Finish the Following Items:
 - 1.1.4.1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
 - 1.1.4.2. Items indicated to receive other finishes.
 - 1.1.4.3. Items indicated to remain unfinished.
 - 1.1.4.4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
 - 1.1.4.5. Stainless steel, anodized aluminum, bronze, terne-coated stainless steel, zinc, and lead.
 - 1.1.4.6. Marble, granite, slate, and other natural stones.
 - 1.1.4.7. Floors, unless specifically indicated.
 - 1.1.4.8. Ceramic and other types of tiles.
 - 1.1.4.9. Brick, glass unit masonry, architectural concrete, cast stone, integrally colored plaster and stucco.
 - 1.1.4.10. Glass.
 - 1.1.4.11. Concealed pipes, ducts, and conduits.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.

1.3. DEFINITIONS

- 1.3.1. Comply with ASTM D16 for interpretation of terms used in this section.

1.4. REFERENCE STANDARDS

- 1.4.1. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2024.
- 1.4.2. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials; 2020 (Reapproved 2025).
- 1.4.3. MPI (APL) - Master Painters Institute Approved Products List; Master Painters and Decorators Association; Current Edition.
- 1.4.4. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.
- 1.4.5. SCAQMD 1113 - Architectural Coatings; 1977, with Amendment (2016).

1.5. SUBMITTALS

- 1.5.1. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
 - 1.5.2. Product Data: Provide complete list of products to be used, with the following information for each:
-

- 1.5.2.1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
- 1.5.2.2. MPI product number (e.g. MPI #47).
- 1.5.2.3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.

1.6. QUALITY ASSURANCE

- 1.6.1. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum ten years documented experience.

1.7. DELIVERY, STORAGE, AND HANDLING

- 1.7.1. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- 1.7.2. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- 1.7.3. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.8. FIELD CONDITIONS

- 1.8.1. Do not apply materials when surface and ambient temperatures are outside the paint product manufacturer's temperature ranges.
- 1.8.2. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- 1.8.3. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

2. PART 2 PRODUCTS

2.1. MANUFACTURERS

- 2.1.1. Provide paints and finishes used in any individual system from the same manufacturer; no exceptions.
- 2.1.2. Paints:
 - 2.1.2.1. Sherwin-Williams Company; ____: www.sherwin-williams.com/#sle.
 - 2.1.2.2. Benjamin Moore: www.benjaminmoore.com.
- 2.1.3. Primer Sealers: Same manufacturer as top coats.
- 2.1.4. Substitutions: See Section 01 60 00 - Product Requirements.

2.2. PAINTS AND FINISHES - GENERAL

- 2.2.1. Paints and Finishes: Ready-mixed, unless required to be a field-catalyzed paint.
 - 2.2.1.1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
 - 2.2.1.2. Supply each paint material in quantity required to complete entire project's work from a single production run.
 - 2.2.1.3. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is described explicitly in manufacturer's product instructions.
- 2.2.2. Volatile Organic Compound (VOC) Content: Comply with Section 01 61 16.
- 2.2.3. Flammability: Comply with applicable code for surface burning characteristics.
- 2.2.4. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Alba Architects from the manufacturer's full line.

- 2.2.5. Colors: To be selected from manufacturer's full range of available colors.
- 2.2.5.1. Selection to be made by Alba Architects after award of contract.

2.3. PAINT SYSTEMS - EXTERIOR

- 2.3.1. Paint E-OP - Exterior Surfaces to be Painted, Unless Otherwise Indicated: Including fiber cement siding and primed wood.
 - 2.3.1.1. Two top coats and one coat primer.
 - 2.3.1.2. Top Coat(s): Exterior Latex, High Performance Architectural; MPI #311 or 315.
 - 2.3.1.3. Top Coat Sheen:
 - A. Satin: MPI gloss level 4; use this sheen at all locations.

2.4. ACCESSORY MATERIALS

- 2.4.1. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.
- 2.4.2. Patching Material: Latex filler.
- 2.4.3. Fastener Head Cover Material: Latex filler.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Do not begin application of paints and finishes until substrates have been properly prepared.
- 3.1.2. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- 3.1.3. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- 3.1.4. Test shop-applied primer for compatibility with subsequent cover materials.
- 3.1.5. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
 - 3.1.5.1. Fiber Cement Siding: 12 percent.
 - 3.1.5.2. Exterior Wood: 15 percent, measured in accordance with ASTM D4442.

3.2. PREPARATION

- 3.2.1. Clean surfaces thoroughly and correct defects prior to application.
- 3.2.2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- 3.2.3. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces for finishing.
- 3.2.4. Seal surfaces that might cause bleed through or staining of topcoat.
- 3.2.5. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- 3.2.6. Fiber Cement Siding: Remove dirt, dust and other foreign matter with a stiff fiber brush. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
- 3.2.7. Exterior Wood Surfaces to Receive Opaque Finish: Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior calking compound after prime coat has been applied. Back prime concealed surfaces before installation.

3.3. APPLICATION

- 3.3.1. Exterior Wood to Receive Opaque Finish: If final painting must be delayed more than 2 weeks after installation of woodwork, apply primer within 2 weeks and final coating within 4 weeks.

- 3.3.2. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".
- 3.3.3. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- 3.3.4. Apply each coat to uniform appearance.
- 3.3.5. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- 3.3.6. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.4. CLEANING

- 3.4.1. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.5. PROTECTION

- 3.5.1. Protect finishes until completion of project.
- 3.5.2. Touch-up damaged finishes after Substantial Completion.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 09 91 23

INTERIOR PAINTING

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Surface preparation.
- 1.1.2. Field application of paints.
- 1.1.3. Scope: Finish interior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
 - 1.1.3.1. Both sides and edges of plywood backboards for electrical and telecom equipment before installing equipment.
 - 1.1.3.2. Surfaces inside cabinets.
 - 1.1.3.3. Mechanical and Electrical:
 - A. In finished areas, paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment, and electrical equipment, unless otherwise indicated.
 - B. In finished areas, paint shop-primed items.
- 1.1.4. Do Not Paint or Finish the Following Items:
 - 1.1.4.1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
 - 1.1.4.2. Items indicated to receive other finishes.
 - 1.1.4.3. Items indicated to remain unfinished.
 - 1.1.4.4. Fire rating labels, equipment serial number and capacity labels, bar code labels, and operating parts of equipment.
 - 1.1.4.5. Stainless steel, anodized aluminum, bronze, terne-coated stainless steel, and lead items.
 - 1.1.4.6. Marble, granite, slate, and other natural stones.
 - 1.1.4.7. Floors, unless specifically indicated.
 - 1.1.4.8. Ceramic and other tiles.
 - 1.1.4.9. Brick, architectural concrete, cast stone, integrally colored plaster, and stucco.
 - 1.1.4.10. Glass.
 - 1.1.4.11. Concrete masonry units in utility, mechanical, and electrical spaces.
 - 1.1.4.12. Concealed pipes, ducts, and conduits.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.

1.3. DEFINITIONS

- 1.3.1. Comply with ASTM D16 for interpretation of terms used in this section.

1.4. REFERENCE STANDARDS

- 1.4.1. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2024.
- 1.4.2. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials; 2020 (Reapproved 2025).
- 1.4.3. MPI (APL) - Master Painters Institute Approved Products List; Master Painters and Decorators Association; Current Edition.

- 1.4.4. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.
- 1.4.5. SCAQMD 1113 - Architectural Coatings; 1977, with Amendment (2016).

1.5. SUBMITTALS

- 1.5.1. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- 1.5.2. Product Data: Provide complete list of products to be used, with the following information for each:
 - 1.5.2.1. Manufacturer's name, product name and/or catalog number, and general product category (e.g., "alkyd enamel").
 - 1.5.2.2. MPI product number (e.g., MPI #47).
 - 1.5.2.3. Cross-reference to specified paint system products to be used in project; include description of each system.

1.6. QUALITY ASSURANCE

- 1.6.1. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum ten years documented experience.
- 1.6.2. Applicator Qualifications: Company specializing in performing the type of work specified with minimum five years experience.

1.7. DELIVERY, STORAGE, AND HANDLING

- 1.7.1. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- 1.7.2. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- 1.7.3. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.8. FIELD CONDITIONS

- 1.8.1. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- 1.8.2. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- 1.8.3. Provide lighting level of 80 fc measured mid-height at substrate surface.

2. PART 2 PRODUCTS

2.1. MANUFACTURERS

- 2.1.1. Provide paints and finishes used in any individual system from the same manufacturer; no exceptions.
- 2.1.2. Paints:
 - 2.1.2.1. Sherwin-Williams Company: www.sherwin-williams.com/#sle.
 - 2.1.2.2. Benjamin Moore: www.benjaminmoore.com.
- 2.1.3. Primer Sealers: Same manufacturer as top coats.
- 2.1.4. Substitutions: See Section 01 60 00 - Product Requirements.

2.2. PAINTS AND FINISHES - GENERAL

- 2.2.1. Paints and Finishes: Ready-mixed, unless intended to be a field-catalyzed paint.

- 2.2.1.1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
- 2.2.1.2. Supply each paint material in quantity required to complete entire project's work from a single production run.
- 2.2.1.3. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.
- 2.2.2. Volatile Organic Compound (VOC) Content: See Section 01 61 16.
- 2.2.3. Flammability: Comply with applicable code for surface burning characteristics.
- 2.2.4. Colors: To be selected from manufacturer's full range of available colors.
 - 2.2.4.1. Selection to be made by Alba Architects after award of contract.
 - 2.2.4.2. Allow for minimum of three colors for each system, unless otherwise indicated, without additional cost to Whitefield Library.
 - 2.2.4.3. In finished areas, finish pipes, ducts, conduit, and equipment the same color as the wall/ceiling under which they are mounted.

2.3. PAINT SYSTEMS - INTERIOR

- 2.3.1. Paint I-OP - Interior Surfaces to be Painted, Unless Otherwise Indicated: Including gypsum board, wood, and plaster.
 - 2.3.1.1. Two top coats and one coat primer.
 - 2.3.1.2. Top Coat(s): High Performance Architectural Interior Latex; MPI #138, 139, 140, 141, or 142.
 - 2.3.1.3. Top Coat Sheen:
 - A. Flat: MPI gloss level 1; use this sheen for ceilings and other overhead surfaces.
 - B. Eggshell: MPI gloss level 3; use this sheen at all locations.
 - C. Satin: MPI gloss level 4; use this sheen for items subject to frequent touching by occupants, including door frames and railings.
- 2.3.2. Paint I-OP-MD-DT - Medium Duty Door/Trim: For surfaces subject to frequent contact by occupants, including metals and wood:
 - 2.3.2.1. Medium duty applications include doors, door frames, railings, handrails, guardrails, and balustrades.
 - 2.3.2.2. Two top coats and one coat primer.
 - 2.3.2.3. Top Coat(s): High Performance Architectural Interior Latex; MPI #138, 139, 140, 141, or 142.
 - 2.3.2.4. Top Coat Sheen:
 - A. Semi-Gloss: MPI gloss level 5; use this sheen at all locations.
- 2.3.3. Paint I-OP-MD-WC - Medium Duty Vertical and Overhead: Including gypsum board and plaster.
 - 2.3.3.1. Two top coats and one coat primer.
 - 2.3.3.2. Top Coat(s): High Performance Architectural Interior Latex; MPI #138, 139, 140, 141, or 142.
 - 2.3.3.3. Top Coat Sheen:
 - A. Flat: MPI gloss level 1; use this sheen for ceilings and other overhead surfaces.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Do not begin application of paints and finishes until substrates have been adequately prepared.
- 3.1.2. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- 3.1.3. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

- 3.1.4. If substrate preparation is the responsibility of another installer, notify Alba Architects of unsatisfactory preparation before proceeding.
- 3.1.5. Test shop-applied primer for compatibility with subsequent cover materials.
- 3.1.6. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces is below the following maximums:
 - 3.1.6.1. Gypsum Wallboard: 12 percent.
 - 3.1.6.2. Plaster and Stucco: 12 percent.
 - 3.1.6.3. Interior Wood: 15 percent, measured in accordance with ASTM D4442.

3.2. PREPARATION

- 3.2.1. Clean surfaces thoroughly and correct defects prior to application.
- 3.2.2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- 3.2.3. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
- 3.2.4. Seal surfaces that might cause bleed through or staining of topcoat.
- 3.2.5. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.
- 3.2.6. Plaster: Fill hairline cracks, small holes, and imperfections with latex patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high-alkali surfaces.
- 3.2.7. Wood Surfaces to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.
- 3.2.8. Wood Doors to be Field-Finished: Seal wood door top and bottom edge surfaces with clear sealer.

3.3. APPLICATION

- 3.3.1. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- 3.3.2. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".
- 3.3.3. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- 3.3.4. Apply each coat to uniform appearance in thicknesses specified by manufacturer.
- 3.3.5. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.
- 3.3.6. Sand wood and metal surfaces lightly between coats to achieve required finish.
- 3.3.7. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- 3.3.8. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.4. CLEANING

- 3.4.1. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.5. PROTECTION

- 3.5.1. Protect finishes until completion of project.

3.5.2. Touch-up damaged finishes after Substantial Completion.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 09 93 00

STAINING AND TRANSPARENT FINISHING

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Field application of stains.
- 1.1.2. Field application of transparent finishes.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- 1.2.2. Section 09 91 13 - Exterior Painting: Stains and transparent finishes for concrete substrates.
- 1.2.3. Section 09 91 23 - Interior Painting: Stains and transparent finishes for concrete substrates.

1.3. DEFINITIONS

- 1.3.1. Comply with ASTM D16 for interpretation of terms used in this section.

1.4. REFERENCE STANDARDS

- 1.4.1. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2024.
- 1.4.2. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials; 2020 (Reapproved 2025).
- 1.4.3. MPI (APL) - Master Painters Institute Approved Products List; Master Painters and Decorators Association; Current Edition.
- 1.4.4. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.

1.5. SUBMITTALS

- 1.5.1. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- 1.5.2. Product Data: Provide complete list of products to be used, with the following information for each:
 - 1.5.2.1. Manufacturer's name, product name and catalog number, and general product category.

1.6. QUALITY ASSURANCE

- 1.6.1. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with at least ten years of documented experience.

1.7. DELIVERY, STORAGE, AND HANDLING

- 1.7.1. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
 - 1.7.2. Container Label: Include manufacturer's name, type of stain or transparent finish, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
 - 1.7.3. Stain and Transparent Finish Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.
-

1.8. FIELD CONDITIONS

- 1.8.1. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by manufacturer of stains and transparent finishes.
- 1.8.2. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

2. PART 2 PRODUCTS

2.1. MANUFACTURERS

- 2.1.1. Provide finishes used in any individual system from the same manufacturer; no exceptions.
- 2.1.2. Transparent Finishes:
 - 2.1.2.1. Behr Process Corporation: www.behr.com/#sle.
 - 2.1.2.2. Sherwin-Williams Company: www.sherwin-williams.com/#sle.
 - 2.1.2.3. Benjamin Moore: www.benjaminmoore.com.
 - 2.1.2.4. Substitutions: See Section 01 60 00 - Product Requirements.

2.2. STAINS AND TRANSPARENT FINISHES - GENERAL

- 2.2.1. Finishes:
 - 2.2.1.1. Provide finishes capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
 - 2.2.1.2. Provide materials compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
 - 2.2.1.3. Supply each finish material in quantity required to complete entire project's work from a single production run.
 - 2.2.1.4. Do not reduce, thin, or dilute finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.
- 2.2.2. Volatile Organic Compound (VOC) Content: See Section 01 61 16.
- 2.2.3. Flammability: Comply with applicable code for surface burning characteristics.
- 2.2.4. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Alba Architects from the manufacturer's full line.
- 2.2.5. Colors: To be selected from manufacturer's full range of available colors.
 - 2.2.5.1. Selection to be made by Alba Architects after award of contract.

2.3. INTERIOR STAIN AND TRANSPARENT FINISH SYSTEMS

- 2.3.1. Finish on Wood - Doors:
 - 2.3.1.1. Stain: Semi-transparent stain for wood, water based; MPI #186.
 - 2.3.1.2. Sealer: Water based, sanding sealer, clear.
 - 2.3.1.3. Top Coat Sheen:
 - A. Semi-Gloss: MPI gloss level 5; use this sheen at all locations.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Do not begin application of stains and finishes until substrates have been properly prepared.
- 3.1.2. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

- 3.1.3. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.
- 3.1.4. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
 - 3.1.4.1. Wood: 15 percent, measured in accordance with ASTM D4442.

3.2. PREPARATION

- 3.2.1. Clean surfaces thoroughly and correct defects prior to application.
- 3.2.2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- 3.2.3. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
- 3.2.4. Seal surfaces that might cause bleed through or staining of topcoat.
- 3.2.5. Wood Surfaces to Receive Transparent Finish: Wipe off dust and grit prior to sealing, seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after sealer has dried; sand lightly between coats. Prime concealed surfaces with gloss varnish reduced 25 percent with thinner.
- 3.2.6. Wood Doors to be Field-Finished: Seal wood door top and bottom edge surfaces with clear sealer.

3.3. APPLICATION

- 3.3.1. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".
- 3.3.2. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- 3.3.3. Apply each coat to uniform appearance in thicknesses specified by manufacturer.
- 3.3.4. Reinstall items removed prior to finishing.

3.4. CLEANING

- 3.4.1. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.5. PROTECTION

- 3.5.1. Protect finishes until completion of project.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 10 14 19

DIMENSIONAL LETTER SIGNAGE

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Dimensional letter signage.

1.2. REFERENCE STANDARDS

- 1.2.1. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.
- 1.2.2. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- 1.2.3. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.3. SUBMITTALS

- 1.3.1. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- 1.3.2. Product Data: Manufacturer's product literature for each type of dimensional letter sign, indicating style, font, colors, locations, and overall dimensions of each sign.
- 1.3.3. Shop Drawings:
 - 1.3.3.1. Include dimensions, locations, elevations, materials, text and graphic layout, and attachment details.

1.4. QUALITY ASSURANCE

- 1.4.1. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years of documented experience.

1.5. DELIVERY, STORAGE, AND HANDLING

- 1.5.1. Package dimensional letter signs as required to prevent damage before installation.
- 1.5.2. Store under cover and elevated above grade.
- 1.5.3. Store tape adhesive at a normal room temperature of 68 to 72 degrees F.

1.6. FIELD CONDITIONS

- 1.6.1. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.
- 1.6.2. Maintain minimum ambient temperature during and after installation.

2. PART 2 PRODUCTS

2.1. MANUFACTURERS

- 2.1.1. Dimensional Letter Signs:
 - 2.1.1.1. CityScapes Inc: www.cityscapesinc.com/#sle.
 - 2.1.1.2. FASTSIGNS International, Inc: www.fastsigns.com/#sle.
 - 2.1.1.3. Substitutions: See Section 01 60 00 - Product Requirements.

2.2. REGULATORY REQUIREMENTS

- 2.2.1. Accessibility Requirements: Comply with ADA Standards and ICC A117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most restrictive requirements.

2.3. DIMENSIONAL LETTERS

- 2.3.1. Applications: Building identification.
 - 2.3.1.1. Use individual plastic letters.
 - 2.3.1.2. Mounting Location: Exterior as indicated on drawings.
 - 2.3.1.3. Allow for total of 50 letters, 10 inches high.
- 2.3.2. Plastic Letters:
 - 2.3.2.1. Material: Injection molded plastic.
 - 2.3.2.2. Thickness: Manufacturer's standard for letter size.
 - 2.3.2.3. Letter Height: 10 inches.
 - 2.3.2.4. Text and Typeface:
 - A. Character Font: Helvetica, Arial, or other sans serif font.
 - B. Character Case: Upper case only.
 - 2.3.2.5. Finish: Semi-gloss.
 - 2.3.2.6. Color: As selected.
 - 2.3.2.7. Mounting: Concealed or exposed screws.

2.4. ACCESSORIES

- 2.4.1. Concealed Screws: Noncorroding metal; stainless steel, galvanized steel, chrome plated, or other.
- 2.4.2. Exposed Screws: Stainless steel.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Verify that substrate surfaces are ready to receive work.
- 3.1.2. Notify Alba Architects if conditions are not suitable for installation of signs; do not proceed until conditions are satisfactory.

3.2. INSTALLATION

- 3.2.1. Install in accordance with manufacturer's instructions.
- 3.2.2. Install with horizontal edges level.
- 3.2.3. Locate dimensional letter signs and mount at heights indicated on drawings and in accordance with ADA Standards and ICC A117.1.
- 3.2.4. Protect from damage until 11-27-2026; repair or replace damaged items.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 10 14 23

PANEL SIGNAGE

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Panel signage.

1.2. REFERENCE STANDARDS

- 1.2.1. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- 1.2.2. ASTM A475 - Standard Specification for Metallic-Coated Steel Wire Strand; 2022.
- 1.2.3. ASTM A555/A555M - Standard Specification for General Requirements for Stainless Steel Wire and Wire Rods; 2023.
- 1.2.4. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.
- 1.2.5. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.
- 1.2.6. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.
- 1.2.7. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.3. SUBMITTALS

- 1.3.1. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- 1.3.2. Product Data: Manufacturer's product literature for each type of panel sign, indicating styles, font, foreground and background colors, locations, and overall dimensions of each sign.
- 1.3.3. Shop Drawings:
 - 1.3.3.1. Include dimensions, locations, elevations, materials, text and graphic layout, attachment details, and schedules.
- 1.3.4. Manufacturer's qualification statement.

1.4. QUALITY ASSURANCE

- 1.4.1. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

1.5. DELIVERY, STORAGE, AND HANDLING

- 1.5.1. Package signs as required to prevent damage before installation.
- 1.5.2. Package room and door signs in sequential order of installation, labeled by floor or building.
- 1.5.3. Store tape adhesive at normal room temperature.

1.6. FIELD CONDITIONS

- 1.6.1. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.
- 1.6.2. Maintain minimum ambient temperature during and after installation.

2. PART 2 PRODUCTS

2.1. MANUFACTURERS

- 2.1.1. Panel Signage:
 - 2.1.1.1. Best Sign Systems, Inc: www.bestsigns.com/#sle.
 - 2.1.1.2. FASTSIGNS International, Inc: www.fastsigns.com/#sle.
 - 2.1.1.3. Mohawk Sign Systems, Inc: www.mohawksign.com/#sle.
 - 2.1.1.4. Substitutions: See Section 01 60 00 - Product Requirements.

2.2. REGULATORY REQUIREMENTS

- 2.2.1. Accessibility Requirements: Comply with ADA Standards and ICC A117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most restrictive requirements.

2.3. PANEL SIGNAGE

- 2.3.1. Panel Signage:
 - 2.3.1.1. Application: Room and door signs.
 - 2.3.1.2. Description: Flat signs with engraved panel media, tactile characters.
 - 2.3.1.3. Sign Size: 4 inches by 6 inches.
 - 2.3.1.4. Total Thickness: 1/8 inch.
 - 2.3.1.5. Sign Edges: Squared.
 - 2.3.1.6. Color and Font, unless otherwise indicated:
 - A. Character Font: Helvetica, Arial, or other sans serif font.
 - B. Character Case: Upper and lower case (title case).
 - C. Background Color: As scheduled.
 - D. Character Color: Contrasting color.
 - 2.3.1.7. Material: Laminated colored plastic engraved through face to expose core as background color.
 - 2.3.1.8. Profile: Flat panel in aluminum frame.
 - A. Frame Finish: Black anodized.
 - 2.3.1.9. Tactile Letters: Raised 1/32 inch minimum.
 - 2.3.1.10. Braille: Grade II, ADA-compliant.

2.4. SIGNAGE APPLICATIONS

- 2.4.1. Room and Door Signs:
 - 2.4.1.1. Office Doors: Identify with room names and numbers to be determined later, not those indicated on drawings.
 - 2.4.1.2. Conference and Meeting Rooms: Identify with room names and numbers to be determined later, not those indicated on drawings.
 - 2.4.1.3. Service Rooms: Identify with room names and numbers to be determined later, not those indicated on drawings.
 - 2.4.1.4. Rest Rooms: Identify with pictograms, the names "MEN" and "WOMEN", room numbers to be determined later, and braille.
- 2.4.2. Interior Directional and Informational Panel Signs:
 - 2.4.2.1. Where suspended, ceiling mounted, or projecting from wall signs are indicated, provide two-sided signs with same information on both sides.

2.5. ACCESSORIES

- 2.5.1. Concealed Screws: Noncorroding metal; stainless steel, galvanized steel, chrome plated, or other.
- 2.5.2. Tape Adhesive: Double-sided tape, permanent adhesive.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Verify that substrate surfaces are ready to receive work.
- 3.1.2. Notify Alba Architects if conditions are not suitable for installation of signs; do not proceed until conditions are satisfactory.

3.2. INSTALLATION

- 3.2.1. Install in accordance with manufacturer's instructions.
- 3.2.2. Install with horizontal edges level.
- 3.2.3. Locate panel signs and mount at heights indicated on drawings and in accordance with ADA Standards and ICC A117.1.
- 3.2.4. Protect from damage until 11-27-2026; repair or replace damaged items.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 10 22 39

FOLDING PANEL PARTITIONS

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Top-supported folding panel partitions, horizontal opening.
- 1.1.2. Top-supported operable panel partitions.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 06 10 00 - Rough Carpentry: Wood blocking and track support shimming.
- 1.2.2. Section 06 20 00 - Finish Carpentry: Product requirements for plastic laminate finish for installation by this section.
- 1.2.3. Section 09 91 23 - Interior Painting: Field applied paint finish to panels.

1.3. REFERENCE STANDARDS

- 1.3.1. ANSI A208.1 - American National Standard for Particleboard; 2022.
- 1.3.2. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
- 1.3.3. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2024.
- 1.3.4. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- 1.3.5. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.
- 1.3.6. ASTM E557 - Standard Guide for Architectural Design and Installation Practices for Sound Isolation Between Spaces Separated by Operable Partitions; 2012 (Reapproved 2026).
- 1.3.7. ASTM E596 - Standard Test Method for Laboratory Measurement of Noise Reduction of Sound-Isolating Enclosures; 2022.
- 1.3.8. ASTM F793/F793M - Standard Classification of Wall Coverings and Ceiling Coverings by Use Characteristics; 2025.
- 1.3.9. UL (FRD) - Fire Resistance Directory; Current Edition.

1.4. SUBMITTALS

- 1.4.1. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- 1.4.2. Product Data: Provide data on partition materials, operation, hardware and accessories, electric operating components, track switching components, and colors and finishes available.
- 1.4.3. Shop Drawings: Indicate opening sizes, track layout, details of track and required supports, static and dynamic loads, location and details of pass door and frame, adjacent construction and finish trim, and stacking depth.

1.5. QUALITY ASSURANCE

- 1.5.1. Manufacturer Qualifications: Company specializing in manufacturing products specified this section with minimum _____ years of documented experience.
- 1.5.2. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years of documented experience.

1.6. DELIVERY, STORAGE, AND HANDLING

- 1.6.1. Store products in manufacturer's unopened packaging until installation.

1.7. WARRANTY

- 1.7.1. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- 1.7.2. Provide two year manufacturer warranty against defects in material and workmanship, excluding abuse.

2. PART 2 PRODUCTS

2.1. MANUFACTURERS

- 2.1.1. Operable Panel Partitions - Horizontal Opening:
 - 2.1.1.1. Substitutions: See Section 01 60 00 - Product Requirements.

2.2. FOLDING PANEL PARTITIONS - HORIZONTAL OPENING

- 2.2.1. Folding Panel Partitions: Side opening; paired panels; side stacking; manually operated.
- 2.2.2. Panel Construction:
 - 2.2.2.1. Frame: 16 gauge, 0.0598 inch thick formed sheet steel frame top, bottom, jambs, and intermediates; welded construction, with acoustical insulation fill.
 - 2.2.2.2. Panel Properties:
 - A. Thickness With Finish: 4 inches.
 - B. Width: Standard width.
- 2.2.3. Panel Finishes:
 - 2.2.3.1. Facing: Vinyl coated fabric.
- 2.2.4. Panel Seals:
 - 2.2.4.1. Panel to Panel Seals: Grooved and gasketed astragals, with continuous flexible ribbed vinyl seal fitted to panel edge construction; color to match panel finish.
 - 2.2.4.2. Acoustic Seals: Flexible acoustic seals at jambs, meeting mullions, ceilings, retractable floor and ceiling seals, and above track to structure acoustic seal.
- 2.2.5. Suspension System:
 - 2.2.5.1. Track: Formed steel; 1-1/4 by 1-1/4 inch size; thickness and profile designed to support loads, steel sub-channel and track connectors, and track switches.
 - 2.2.5.2. Carriers: Nylon wheels on trolley carrier at top of every second panel, sized to carry imposed loads, with threaded pendant bolt for vertical adjustment.
- 2.2.6. Performance:
 - 2.2.6.1. Acoustic Performance:
 - A. Noise Reduction Coefficient (NRC): ASTM E596, NRC of 0.65 minimum.
 - 2.2.6.2. Surface Burning Characteristics of Panel Finish: Flame spread/smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84.
 - 2.2.6.3. Installed partition system track capable of supporting imposed loads, with maximum deflection of 1/360 of span.
- 2.2.7. Accessories:

2.3. MATERIALS

- 2.3.1. Vinyl Coated Fabric: ASTM F793 Category VI, polyvinyl fluoride (PVC) finish for washability and improved flame retardance; color as selected by Architect from manufacturer's standard range.
- 2.3.2. Acoustic Insulation:
 - 2.3.2.1. Type: As required for acoustic performance indicated.

2.3.2.2. Thickness: As required for acoustic performance indicated.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Verify that field measurements are as indicated.
- 3.1.2. Verify track supports are laterally braced and will permit track to be level within 1/4 inch of required position and parallel to the floor surface.
- 3.1.3. Verify floor flatness of 1/8 inch in 10 feet, non-cumulative.
- 3.1.4. Verify wall plumbness of 1/8 inch in 10 feet, non-cumulative.

3.2. INSTALLATION

- 3.2.1. Install partition in accordance with manufacturer's instructions and ASTM E557.
- 3.2.2. Install acoustic sealant to achieve required acoustic performance.
- 3.2.3. Coordinate electrical connections.

3.3. ADJUSTING

- 3.3.1. Adjust partition assembly to provide smooth operation from stacked to full open position. Do not over-compress acoustic seals.
- 3.3.2. Visually inspect partition in full extended position for light leaks to identify a potential acoustical leak.
- 3.3.3. Adjust partition assembly to achieve lightproof seal.

3.4. CLEANING

- 3.4.1. Clean finish surfaces and partition accessories.

3.5. CLOSEOUT ACTIVITIES

- 3.5.1. Demonstrate operation of partition and identify potential operational problems.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 10 26 00

WALL AND DOOR PROTECTION

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Corner guards.
- 1.1.2. Door and frame protection.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 05 50 00 - Metal Fabrications: Corner guards fabricated from rolled metal sections or bent plate.
- 1.2.2. Section 08 71 00 - Door Hardware: Standard protection plates and trim.
- 1.2.3. Section 09 21 16 - Gypsum Board Assemblies: Placement of supports in stud wall construction.

1.3. REFERENCE STANDARDS

- 1.3.1. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- 1.3.2. ASTM D256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics; 2024.
- 1.3.3. ASTM D543 - Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents; 2021.
- 1.3.4. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- 1.3.5. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2024.
- 1.3.6. ASTM F476 - Standard Test Methods for Security of Swinging Door Assemblies; 2023.
- 1.3.7. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).
- 1.3.8. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.4. SUBMITTALS

- 1.4.1. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- 1.4.2. Product Data: Indicate physical dimensions, features, wall mounting brackets with mounted measurements, anchorage details, and rough-in measurements.
- 1.4.3. Shop Drawings: Include plans, elevation, sections, and attachment details.
- 1.4.4. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Whitefield Library's name and registered with manufacturer.

1.5. DELIVERY, STORAGE, AND HANDLING

- 1.5.1. Deliver wall and door protection items in original, undamaged protective packaging. Label items to designate installation locations.
- 1.5.2. Do not deliver products to project site until areas for storage and installation are fully enclosed, and interior temperature and humidity are in compliance with manufacturer's recommendations for each type of item.
- 1.5.3. Store products in either horizontal or vertical position, in compliance with manufacturer's instructions.

1.6. WARRANTY

- 1.6.1. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- 1.6.2. Manufacturer Warranty: Provide 5-year manufacturer warranty for metal crash rails. Complete forms in Whitefield Library's name and register with manufacturer.

2. PART 2 PRODUCTS

2.1. PERFORMANCE CRITERIA

- 2.1.1. Impact Strength: Unless otherwise noted, provide protection products and assemblies that have been successfully tested for compliance with applicable provisions of ASTM D256 and/or ASTM F476.
- 2.1.2. Chemical and Stain Resistance: Unless otherwise noted, provide protection products and assemblies with chemical and stain resistance complying with applicable provisions of ASTM D543.
- 2.1.3. Fungal Resistance: Unless otherwise noted, provide protection products and assemblies which pass ASTM G21 testing.

2.2. PRODUCT TYPES

- 2.2.1. Corner Guards - Surface Mounted:
 - 2.2.1.1. Material: High impact vinyl with full height extruded aluminum retainer.
 - 2.2.1.2. Material: Polyethylene terephthalate (PET or PETG); PVC-free with full height extruded aluminum retainer.
 - 2.2.1.3. Performance: Resist lateral impact force of 100 lbs at any point without damage or permanent set.
 - 2.2.1.4. Surface Burning Characteristics: Provide assemblies with flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
 - 2.2.1.5. Width of Wings: 2 inches.
 - 2.2.1.6. Corner: Square.
 - 2.2.1.7. Color: As selected from manufacturer's standard colors.
 - 2.2.1.8. Length: One piece.
 - 2.2.1.9. Preformed end caps.
- 2.2.2. Corner Guards - Surface Mounted, Transparent Plastic:
 - 2.2.2.1. Material: Clear polycarbonate, extruded.
 - 2.2.2.2. Thickness: 0.075 inch.
 - 2.2.2.3. Performance: Resist lateral impact force of 100 lbs at any point without damage or permanent set.
 - 2.2.2.4. Surface Burning Characteristics: Provide assemblies with flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
 - 2.2.2.5. Width of Wings: 3/4 inches, with radiused corner and rounded wing tips.
 - 2.2.2.6. Corner Angle: 90 degrees.
 - 2.2.2.7. Length: One piece, 48 inches.
- 2.2.3. Doorway Protection:
 - 2.2.3.1. See Section 08 71 00 - Door Hardware for standard protective plates and trim.

2.3. FABRICATION

- 2.3.1. Fabricate components with tight joints, corners and seams.
 - 2.3.2. Pre-drill holes for attachment.
-

2.3.3. Form end trim closure by capping and finishing smooth.

2.4. SOURCE QUALITY CONTROL

- 2.4.1. See Section 01 40 00 - Quality Requirements, for additional requirements.
- 2.4.2. Provide wall and door protection systems of each type from a single source and manufacturer.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Verify that rough openings, concealed blocking, and anchors are correctly sized and located.
- 3.1.2. Verify that substrate surfaces for adhered items are clean and smooth.
- 3.1.3. Start of installation constitutes acceptance of project conditions.

3.2. INSTALLATION

- 3.2.1. Install components in accordance with manufacturer's instructions, level and plumb, secured rigidly in position to supporting construction.
- 3.2.2. Position corner guard 4 inches above finished floor to 42 inches high.

3.3. TOLERANCES

- 3.3.1. Maximum Variation From Required Height: 1/4 inch.
- 3.3.2. Maximum Variation From Level or Plane For Visible Length: 1/4 inch.

3.4. CLEANING

- 3.4.1. Clean wall and door protection items of excess adhesive, dust, dirt, and other contaminants.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 10 28 00

TOILET, BATH, AND LAUNDRY ACCESSORIES

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Commercial toilet accessories.
- 1.1.2. Commercial shower and bath accessories.
- 1.1.3. Under-lavatory pipe supply covers.
- 1.1.4. Electric hand/hair dryers.
- 1.1.5. Diaper changing stations.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 22 40 00 - Plumbing Fixtures: Under-lavatory pipe and supply covers.

1.3. ABBREVIATIONS AND ACRONYMS

- 1.3.1. PETG: Polyethylene Terephthalate Glycol.
- 1.3.2. PPE: Personal Protective Equipment.

1.4. REFERENCE STANDARDS

- 1.4.1. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- 1.4.2. ASME A112.18.9 - Protectors/Insulators for Exposed Waste and Supplies on Accessible Fixtures; 2011 (Reaffirmed 2022).
- 1.4.3. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2024.
- 1.4.4. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 2025.
- 1.4.5. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.
- 1.4.6. ASTM B86 - Standard Specification for Zinc and Zinc-Aluminum (ZA) Alloy Foundry and Die Castings; 2023.
- 1.4.7. ASTM C1036 - Standard Specification for Flat Glass; 2025.
- 1.4.8. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2025.
- 1.4.9. ASTM C1503 - Standard Specification for Silvered Flat Glass Mirror; 2024.
- 1.4.10. ASTM C1822 - Standard Specification for Insulating Covers on Accessible Lavatory Piping; 2021.
- 1.4.11. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- 1.4.12. ASTM F2285 - Standard Consumer Safety Performance Specification for Diaper Changing Tables for Commercial Use; 2022.
- 1.4.13. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).
- 1.4.14. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.5. ADMINISTRATIVE REQUIREMENTS

- 1.5.1. Coordinate the work with the placement of internal wall reinforcement to receive anchor attachments.
-

1.6. SUBMITTALS

- 1.6.1. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- 1.6.2. Product Data: Submit data on accessories describing size, finish, details of function, and attachment methods.

2. PART 2 PRODUCTS

2.1. MANUFACTURERS

- 2.1.1. Commercial Toilet, Shower, and Bath Accessories:
 - 2.1.1.1. Bobrick; www.bobrick.com.
 - 2.1.1.2. Any product equal and approved.
 - 2.1.1.3. Substitutions: Section 01 60 00 - Product Requirements.
- 2.1.2. Electric Hand/Hair Dryers:
 - 2.1.2.1. Excel Dryer: www.exceldryer.com/#sle.
 - 2.1.2.2. Any product equal and approved.
 - 2.1.2.3. Substitutions: Section 01 60 00 - Product Requirements.
- 2.1.3. Diaper Changing Stations:
 - 2.1.3.1. Koala Kare Products: www.koalabear.com/#sle.
 - 2.1.3.2. Any product equal and approved.
 - 2.1.3.3. Substitutions: 01 60 00 - Product Requirements.

2.2. MATERIALS

- 2.2.1. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
- 2.2.2. Stainless Steel Sheet: ASTM A666/A666M, Type 304.
- 2.2.3. Stainless Steel Tubing: ASTM A269/A269M, Grade TP304 or TP316.
- 2.2.4. Mirror Glass: Annealed float glass, ASTM C1036 Type I, Class 1, Quality Q2, with silvering, protective and physical characteristics complying with ASTM C1503.

2.3. FINISHES

- 2.3.1. Stainless Steel: Satin finish, unless otherwise noted.

2.4. COMMERCIAL TOILET ACCESSORIES

- 2.4.1. Toilet Paper Dispenser: Double roll, surface mounted bracket type, satin finished cast aluminum brackets, spindleless type for tension spring delivery designed to prevent theft of tissue roll.
 - 2.4.1.1. Attached Purse Shelf: 0.03 inch satin finished stainless steel, with rolled or formed edge at front.
- 2.4.2. Waste Receptacle: Stainless steel, freestanding style.
 - 2.4.2.1. Minimum capacity: 10 gallons.
- 2.4.3. Automated Soap Dispenser: Liquid soap dispenser, wall-mounted, with stainless steel cover and window to gauge soap level, tumbler lock.
- 2.4.4. Mirrors: Stainless steel framed, 1/4 inch thick annealed float glass; ASTM C1036.
 - 2.4.4.1. Annealed Float Glass: Silvering, protective and physical characteristics in compliance with ASTM C1503.
 - 2.4.4.2. Fixed Tilt Mirrors: Minimum 3 inches tilt from top to bottom.

2.5. COMMERCIAL SHOWER AND BATH ACCESSORIES

- 2.5.1. Shower Curtain Rod: Stainless steel tube, 1 inch outside diameter, 0.04 inch wall thickness, satin-finished, with 3 inch outside diameter, minimum 0.04 inch thick satin-finished stainless steel flanges, for installation with exposed fasteners.
- 2.5.2. Shower Curtain:
 - 2.5.2.1. Material: Cotton, machine washable, and mildew-resistant.
 - 2.5.2.2. Color: White.
- 2.5.3. Towel Pin: Stainless steel, 3 inch extension from wall; rectangular-shaped bracket and backplate for concealed attachment, satin finish.

2.6. UNDER-LAVATORY PIPE AND SUPPLY COVERS

- 2.6.1. Under-Lavatory Pipe and Supply Covers:
 - 2.6.1.1. Insulate exposed drainage piping, including hot, cold, and tempered water supplies under lavatories or sinks to comply with ADA Standards.
 - 2.6.1.2. Exterior Surfaces: Smooth non-absorbent, non-abrasive surfaces.
 - 2.6.1.3. Construction: 1/8 inch flexible PVC.
 - A. Surface Burning Characteristics: Flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
 - B. Comply with ASTM C1822, type indicated.
 - C. Comply with ASME A112.18.9.
 - D. Comply with ICC A117.1.
 - E. Microbial and Fungal Resistance: Comply with ASTM G21.
 - 2.6.1.4. Color: White.

2.7. ELECTRIC HAND/HAIR DRYERS

- 2.7.1. Electric Hand Dryers: Traditional fan-in-case type, with downward fixed nozzle.
 - 2.7.1.1. Operation: Automatic, sensor-operated on and off.
 - 2.7.1.2. Mounting: Wall-mounted - surface.
 - 2.7.1.3. Cover: Aluminum with natural anodized satin finish.
 - A. Tamper-resistant screw attachment of cover to mounting plate.
 - 2.7.1.4. Electric Hand Dryer Products:
 - A. Excel Dryer Inc; XLERATOR: www.exceldryer.com/#sle.
 - B. Any product equal and approved.

2.8. DIAPER CHANGING STATIONS

- 2.8.1. Diaper Changing Station: Wall-mounted folding diaper changing station for use in commercial toilet facilities, meeting or exceeding ASTM F2285.
 - 2.8.1.1. Material: Polyethylene.
 - 2.8.1.2. Mounting: Surface.
 - 2.8.1.3. Color: Gray.
 - 2.8.1.4. Minimum Rated Load: 250 pounds.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Verify existing conditions before starting work.
- 3.1.2. Verify exact location of accessories for installation.

- 3.1.3. For electrically-operated accessories, verify that electrical power connections are ready and in the correct locations.

3.2. PREPARATION

- 3.2.1. Deliver inserts and rough-in frames to site for timely installation.
- 3.2.2. Provide templates and rough-in measurements as required.

3.3. INSTALLATION

- 3.3.1. Install accessories in accordance with manufacturers' instructions in locations indicated on drawings.
- 3.3.2. Install plumb and level, securely and rigidly anchored to substrate.
- 3.3.3. Mounting Heights: As required by accessibility regulations, unless otherwise indicated.
 - 3.3.3.1. Grab Bars: As indicated on drawings.

3.4. PROTECTION

- 3.4.1. Protect installed accessories from damage due to subsequent construction operations.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 10 44 00
FIRE PROTECTION SPECIALTIES

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Fire extinguishers.
- 1.1.2. Wheeled fire extinguishers.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 06 10 00 - Rough Carpentry: Wood blocking.
- 1.2.2. Section 09 91 23 - Interior Painting.

1.3. REFERENCE STANDARDS

- 1.3.1. FM (AG) - FM Approval Guide; Current Edition.
- 1.3.2. NFPA 10 - Standard for Portable Fire Extinguishers; 2026.
- 1.3.3. UL (DIR) - Online Certifications Directory; Current Edition.

1.4. SUBMITTALS

- 1.4.1. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- 1.4.2. Product Data: Provide extinguisher operational features and extinguisher ratings and classifications.

1.5. FIELD CONDITIONS

- 1.5.1. Do not install extinguishers when ambient temperature causes freezing of extinguisher ingredients.

2. PART 2 PRODUCTS

2.1. MANUFACTURERS

- 2.1.1. Fire Extinguishers:
 - 2.1.1.1. Ansul, a Tyco Business: www.ansul.com/#sle.
 - 2.1.1.2. Kidde, a unit of United Technologies Corp: www.kidde.com/#sle.
 - 2.1.1.3. Pyro-Chem, a Tyco Business: www.pyrochem.com/#sle.

2.2. FIRE EXTINGUISHERS

- 2.2.1. General Requirements: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.
 - 2.2.1.1. Provide extinguishers labeled by UL (DIR) or FM (AG) for purpose specified and as indicated on drawings.
 - 2.2.2. Multipurpose Dry-Chemical-Type Fire Extinguishers: Carbon steel tank, with pressure gauge.
 - 2.2.2.1. Cartridge Operated: Spun shell.
 - 2.2.2.2. Stored Pressure Operated: Deep drawn.
 - 2.2.2.3. Class: A:B:C.
-

- 2.2.2.4. Size: 10 lb.
- 2.2.2.5. Finish: Baked polyester powder coat; color as selected by Architect.
- 2.2.2.6. Temperature Range: Minus 65 to 120 degrees F.

2.3. ACCESSORIES

- 2.3.1. Fire Blanket: Fire-retardant-treated wool; red, 62-by-84-inch size.
- 2.3.2. Extinguisher Brackets: Formed steel, chrome-plated.
- 2.3.3. Lettering: FIRE EXTINGUISHER text on decal or self-adhesive vinyl, prespaced black lettering in accordance with authorities having jurisdiction.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Verify dimensions, tolerances, and interfaces with other work.
- 3.1.2. Verify substrate and site conditions for product installation are in accordance with manufacturer's written instructions.
- 3.1.3. Verify rough openings for cabinet are sized and located in accordance with manufacturer's written instructions.
- 3.1.4. Notify Alba Architects in writing of conditions detrimental to completion of work. Do not proceed with installation until detrimental conditions are corrected.

3.2. INSTALLATION

- 3.2.1. Install in accordance with manufacturer's instructions.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 11 30 13

RESIDENTIAL APPLIANCES

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Kitchen appliances.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 26 05 83 - Wiring Connections: Electrical connections for appliances.

1.3. REFERENCE STANDARDS

- 1.3.1. ICC (IMC)-2021 - International Mechanical Code; 2021.
- 1.3.2. ICC (IRC)-2021 - International Residential Code for One- and Two-Family Dwellings; 2021.
- 1.3.3. UL (DIR) - Online Certifications Directory; Current Edition.

1.4. SUBMITTALS

- 1.4.1. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- 1.4.2. Product Data: Manufacturer's data indicating dimensions, capacity, and operating features of each piece of residential equipment specified.
- 1.4.3. Copies of Warranties: Submit manufacturer warranty and ensure that forms have been completed in Whitefield Library's name and registered with manufacturer.

1.5. QUALITY ASSURANCE

- 1.5.1. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than ten years of documented experience.
- 1.5.2. Electric Appliances: Listed and labeled by UL (DIR) and complying with NEMA Standards (National Electrical Manufacturers Association).
- 1.5.3. Gas Appliances: Bearing design certification seal of American Gas Association (AGA).

1.6. WARRANTY

- 1.6.1. Provide five (5) year manufacturer warranty on refrigeration system of refrigerators.
- 1.6.2. Provide ten (10) year manufacturer warranty on magnetron tube of microwave ovens.
- 1.6.3. Provide ten (10) year manufacturer warranty on tub and door liner of dishwashers.

2. PART 2 PRODUCTS

2.1. KITCHEN APPLIANCES

- 2.1.1. Provide Equipment Eligible for Energy Star Rating: Energy Star Rated.
- 2.1.2. Refrigerator: Free-standing, side-by-side, and frost-free.
 - 2.1.2.1. Capacity: Total minimum storage of 18 cubic ft; minimum 15 percent freezer capacity.
 - 2.1.2.2. Energy Usage: Minimum 20 percent more energy efficient than energy efficiency standards set by U.S. Department of Energy (DOE).

- 2.1.2.3. Features: Include glass shelves, automatic icemaker, light in freezer compartment, and in-door water and ice dispenser.
- 2.1.2.4. Exterior Finish: Porcelain enameled steel, color as indicated.
- 2.1.2.5. Manufacturers:
 - A. GE Appliances: www.geappliances.com/#sle.
 - B. Any product equal and approved.
 - C. Substitutions: See Section 01 60 00 - Product Requirements.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Verify utility rough-ins are provided and correctly located.

3.2. INSTALLATION

- 3.2.1. Install in accordance with manufacturer's instructions.
- 3.2.2. Anchor built-in equipment in place.

3.3. ADJUSTING

- 3.3.1. Adjust equipment to provide efficient operation.

3.4. CLEANING

- 3.4.1. Remove packing materials from equipment and properly discard.
- 3.4.2. Wash and clean equipment.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 12 24 00 WINDOW SHADES

1. PART 1 GENERAL

1.1. RELATED REQUIREMENTS

- 1.1.1. Section 06 10 00 - Rough Carpentry: Concealed wood blocking for attachment of headrail brackets.

1.2. REFERENCE STANDARDS

- 1.2.1. ASTM E2180 - Standard Test Method for Determining the Activity of Incorporated Antimicrobial Agent(s) in Polymeric or Hydrophobic Materials; 2024.
- 1.2.2. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).
- 1.2.3. C2C (DIR) - C2C Certified Products Registry; Cradle to Cradle Products Innovation Institute; Current Edition.
- 1.2.4. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- 1.2.5. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films; 2023, with Errata.
- 1.2.6. UL (GGG) - GREENGUARD Gold Certified Products; Current Edition.
- 1.2.7. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems; Current Edition, Including All Revisions.
- 1.2.8. WCMA A100.1 - Standard for Safety of Window Covering Products; 2022.

1.3. ADMINISTRATIVE REQUIREMENTS

- 1.3.1. Sequencing:
 - 1.3.1.1. Do not fabricate shades until field dimensions for each opening have been taken with field conditions in place.
 - 1.3.1.2. Do not install shades until final surface finishes and painting are complete.

1.4. SUBMITTALS

- 1.4.1. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- 1.4.2. Product Data: Provide manufacturer's standard catalog pages and data sheets, including materials, finishes, fabrication details, dimensions, profiles, mounting requirements, and accessories.
- 1.4.3. Shop Drawings: Include shade schedule indicating size, location and keys to details, head, jamb and sill details, mounting dimension requirements for each product and condition, and operation direction.
- 1.4.4. Warranty: Submit sample of manufacturer's warranty and documentation of final executed warranty completed in Whitefield Library's name and registered with manufacturer.

1.5. QUALITY ASSURANCE

- 1.5.1. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.

1.6. DELIVERY, STORAGE, AND HANDLING

- 1.6.1. Deliver shades in manufacturer's unopened packaging, labeled to identify each shade for each opening.
- 1.6.2. Handle and store shades in accordance with manufacturer's recommendations.

1.7. FIELD CONDITIONS

- 1.7.1. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.8. WARRANTY

- 1.8.1. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

2. PART 2 PRODUCTS

2.1. MANUFACTURERS

- 2.1.1. Interior Manually Operated Cellular Shades:
 - 2.1.1.1. Graber.
 - 2.1.1.2. Any product equal and approved.
 - 2.1.1.3. Substitutions: See Section 01 60 00 - Product Requirements.

2.2. CELLULAR SHADES

- 2.2.1. General:
 - 2.2.1.1. Provide shade system components that are easy to remove or adjust without removal of mounted shade brackets.
 - 2.2.1.2. Provide shade system that operates smoothly when shades are raised or lowered.
- 2.2.2. Cellular Shades:
 - 2.2.2.1. Basis of Design: Graber - Cellular Shades - 3/4" Single Cell, or approved equal.
 - 2.2.2.2. Description - Interior Cellular Shades: Single cell, manually operated fabric window shade system complete with mounting brackets, hembars, hardware, and accessories.
 - A. Roll Direction: Roll down, closed position is at window sill.
 - B. Mounting: Window jamb mounted - inside, between jambs.
 - C. Size: To fit window openings. .
 - D. Fabric: As indicated under Shade Fabric article.
 - 2.2.2.3. Brackets and Mounting Hardware: As recommended by manufacturer for mounting indicated and to accommodate shade fabric roll-up size and weight.
 - 2.2.2.4. Hembars: Designed to maintain bottom of shade straight and flat.
 - 2.2.2.5. Manual Operation for Interior Shades:
 - A. A. Clutch Operator: Manufacturer's standard material and design, permanently lubricated.
 - B. B. Drive Chain: Continuous loop beaded ball chain, 95 lb minimum breaking strength. Provide upper and lower limit stops.

2.3. SHADE FABRIC

- 2.3.1. Fabric : Nonflammable, color-fast, impervious to heat and moisture, and able to retain its shape under normal
 - 2.3.1.1. Performance Requirements:
 - A. Flammability: Pass NFPA 701 large and small tests.
 - 2.3.1.2. Openness Factor: Light filtering. .
 - 2.3.1.3. Color: As selected by Alba Architects from manufacturer's full range of colors.

2.4. CELLULAR SHADE FABRICATION

- 2.4.1. Field measure finished openings prior to ordering or fabrication.
- 2.4.2. Dimensional Tolerances: Fabricate shades to fit openings within specified tolerances.
 - 2.4.2.1. Vertical Dimensions: Fill openings from head to sill with 1/2 inch space between bottom bar and window stool.
 - 2.4.2.2. Horizontal Dimensions - Inside Mounting: Fill openings from jamb to jamb.
- 2.4.3. Dimensional Tolerances: As recommended in writing by manufacturer.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Examine finished openings for deficiencies that may preclude satisfactory installation.
- 3.1.2. Start of installation shall be considered acceptance of substrates.

3.2. PREPARATION

- 3.2.1. Prepare surfaces using methods recommended by manufacturer for achieving best result for substrate under the project conditions.
- 3.2.2. Coordinate with window installation and placement of concealed blocking to support shades.

3.3. INSTALLATION

- 3.3.1. Install in accordance with manufacturer's instructions and approved shop drawings, using mounting devices as indicated.
- 3.3.2. Replace shades that exceed specified dimensional tolerances at no extra cost to Whitefield Library.
- 3.3.3. Adjust level, projection, and shade centering from mounting bracket. Verify there is no telescoping of shade fabric. Ensure smooth shade operation.

3.4. CLEANING

- 3.4.1. Clean soiled shades and exposed components as recommended by manufacturer.
- 3.4.2. Replace shades that cannot be cleaned to "like new" condition.

3.5. CLOSEOUT ACTIVITIES

- 3.5.1. See Section 01 78 00 - Closeout Submittals, for closeout submittals.

3.6. PROTECTION

- 3.6.1. Protect installed products from subsequent construction operations.
- 3.6.2. Touch-up, repair, or replace damaged products before Substantial Completion.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 12 32 00

MANUFACTURED WOOD CASEWORK

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Manufactured standard casework, with cabinet hardware.
- 1.1.2. Countertops.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions: VOC limitations for adhesives and sealants.
- 1.2.2. Section 06 10 00 - Rough Carpentry: Blocking and nailers for anchoring casework.
- 1.2.3. Section 09 21 16 - Gypsum Board Assemblies: Reinforcements in metal-framed partitions for anchoring casework.

1.3. DEFINITIONS

- 1.3.1. Exposed: Portions of casework visible when drawers and cabinet doors are closed, including end panels, bottoms of cases more than 42 inches above finished floor, tops of cases less than 72 inches above finished floor and all members visible in open cases or behind glass doors.
- 1.3.2. Semi-Exposed: Portions of casework and surfaces behind solid doors, tops of cases more than 72 inches above finished floor and bottoms of cabinets more than 30 inches but less than 42 inches above finished floor.
- 1.3.3. Concealed: Sleepers, web frames, dust panels and other surfaces not generally visible after installation and cabinets less than 30 inches above finished floor.

1.4. REFERENCE STANDARDS

- 1.4.1. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- 1.4.2. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2024.
- 1.4.3. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
- 1.4.4. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.
- 1.4.5. BHMA A156.9 - Cabinet Hardware; 2020.
- 1.4.6. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; 2024.
- 1.4.7. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

1.5. SUBMITTALS

- 1.5.1. See Section 01 30 00 - Administrative Requirements for submittal procedures.
 - 1.5.2. Product Data: Component dimensions, configurations, construction details, joint details, attachments.
 - 1.5.3. Shop Drawings: Indicate casework types, sizes, and locations, using large scale plans, elevations, and cross sections. Include rough-in and anchors and reinforcements, placement dimensions and tolerances, clearances required, and keying information.
 - 1.5.4. Maintenance Data: Manufacturer's recommendations for care and cleaning.
 - 1.5.5. Finish touch-up kit for each type and color of materials provided.
-

1.6. QUALITY ASSURANCE

- 1.6.1. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum ten years of documented experience.
- 1.6.2. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience and approved by manufacturer.

1.7. DELIVERY, STORAGE, AND HANDLING

- 1.7.1. Protect items provided by this section, including finished surfaces and hardware items during handling and installation. For metal surfaces, use polyethylene film or other protective material standard with the manufacturer.
- 1.7.2. Acceptance at Site:
 - 1.7.2.1. Do not deliver or install casework until the conditions specified under Part 3, Examination Article of this section have been met. Products delivered to sites that are not enclosed and/or improperly conditioned will not be accepted if warping or damage due to unsatisfactory conditions occurs.
- 1.7.3. Storage:
 - 1.7.3.1. Store casework in the area of installation. If necessary, prior to installation, temporarily store in another area, meeting the environmental requirements specified under Part 3, "Site Verification of Conditions" Article of this section.

1.8. WARRANTY

- 1.8.1. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- 1.8.2. Correct defective Work within a five year period after Date of Substantial Completion, at no additional cost to Whitefield Library. Defects include, but are not limited to:
 - 1.8.2.1. Ruptured, cracked, or stained finish coating.
 - 1.8.2.2. Discoloration or lack of finish integrity.
 - 1.8.2.3. Cracking or peeling of finish.
 - 1.8.2.4. Failure of hardware.

2. PART 2 PRODUCTS

2.1. CASEWORK, GENERAL

- 2.1.1. Quality Standard: AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
- 2.1.2. Wood Veneer Faced Cabinets: Custom Grade.

2.2. FABRICATION

- 2.2.1. Assembly: Shop assemble casework items for delivery to site in units easily handled and to permit passage through building openings.
- 2.2.2. Construction: As required for selected grade.
- 2.2.3. Structural Performance: Safely support the following minimum loads:
 - 2.2.3.1. Base Units: 500 pounds per linear foot across the cabinet ends.
 - 2.2.3.2. Drawers: 125 pounds, minimum.
- 2.2.4. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.
- 2.2.5. Scribes and Fillers: Panels of matching construction and finish, for locations where cabinets do not fit tight to adjacent construction.

2.3. WOOD-VENEER-FACED CASEWORK

- 2.3.1. Wood-Veneer-Faced Casework: Solid wood and wood panel construction; each unit self-contained and not dependent on adjacent units or building structure for rigidity; in sizes necessary to avoid field cutting except for scribes and filler panels. Include adjustable levelers for base cabinets.
 - 2.3.1.1. Style: Flush overlay. Ease doors and drawer fronts slightly at edges.
 - 2.3.1.2. Cabinet Nominal Dimensions: Unless otherwise indicated, provide cabinets of widths and heights indicated on drawings, and with following front-to-back dimensions:
 - A. Base Cabinets: 24 inches.
 - 2.3.1.3. Finishes:
 - A. Exposed Exterior Surfaces: HPVA HP-1 Grade A, Birch, plain sliced, random-matched.
 - B. Exposed Interior Surfaces: Thermally fused laminate.
 - C. Semi-Exposed Surfaces: HPVA HP-1 Grade B, Birch, plain sliced, random-matched.
 - D. Concealed Surfaces: Manufacturer's option.
 - E. Factory-finish all exposed and semi-exposed surfaces with the same finish.
 - A) Preparation: Wood sanded smooth, free from dust and mill marks.
 - B) Coating: Clear, superior-quality, chemical-resistant acyclic urethane; applied in accordance with manufacturer instructions, force-dried, sanded and wiped clean.
 - C) Coats: Multiple coats as required to achieve minimum 1.5 mil dry film thickness.
 - D) Appearance: Clear satin gloss; not cloudy or muddy.

2.4. COUNTERTOPS

- 2.4.1. Fabricate in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 11 - Countertops, Custom Grade, unless otherwise noted.
- 2.4.2. Plastic Laminate Countertops: High pressure decorative laminate sheet bonded to substrate.
 - 2.4.2.1. Manufacturer's standard configuration for exposed edges, back and end splashes.

2.5. CABINET HARDWARE

- 2.5.1. Manufacturer's standard types, styles and finishes.
- 2.5.2. Comply with BHMA A156.9 requirements.

2.6. MATERIALS

- 2.6.1. Adhesives Used for Assembly: Comply with VOC requirements for adhesives and sealants; see Section 01 61 16.
 - 2.6.2. Wood-Based Materials:
 - 2.6.2.1. Solid Wood: Air-dried to 4.5 percent moisture content, then tempered to 6 percent moisture content before use.
 - 2.6.3. Solid Wood: Clear, dry, sound, plain sawn, selected for compatible species, grain and color, no defects.
 - 2.6.4. Semi-Exposed Solid Wood: Dry, sound, plain sawn, no appearance defects, any species similar in color and grain to exposed portions.
 - 2.6.5. Hardwood Plywood: Veneer core; HPVA HP-1 Grade as indicated; same species as exposed solid wood, clear, compatible grain and color, no defects. Band exposed edges with solid wood of same species as veneer.
 - 2.6.6. Concealed Solid Wood or Plywood: Any species and without defects affecting strength or utility.
-

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Site Verification of Environmental Conditions:
 - 3.1.1.1. Do not deliver casework until the following conditions have been met:
 - A. Building has been enclosed (windows and doors sealed and weather-tight).
 - B. An operational HVAC system that maintains temperature and humidity at occupancy levels has been put in place.
 - C. Ceiling, overhead ductwork, piping, and lighting have been installed.
 - D. Installation areas do not require further "wet work" construction.
- 3.1.2. For Base Cabinets Installation: Examine floor levelness and flatness of installation space. Do not proceed with installation if encountered floor conditions required more than 1/2 inch leveling adjustment. When installation conditions are acceptable, for each space, establish the high point of the floor. Set and make level and plumb first cabinet in relation to this high point.
- 3.1.3. Verify adequacy of support framing and anchors.
- 3.1.4. Verify that service connections are correctly located and of proper characteristics.

3.2. INSTALLATION

- 3.2.1. Perform installation in accordance with manufacturer's instructions.
- 3.2.2. Use anchoring devices to suit conditions and substrate materials encountered. Use concealed fasteners to the greatest degree possible. Use exposed fasteners only where allowed by approved shop drawings, or where concealed fasteners are impracticable.
- 3.2.3. Set casework items plumb and square, securely anchored to building structure.
- 3.2.4. Align cabinets to adjoining components, install filler and/or scribe panels where necessary to close gaps.
- 3.2.5. Fasten together cabinets in continuous runs, with joints flush, uniform and tight. Misalignment of adjacent units not to exceed 1/16 inch. In addition, do not exceed the following tolerances:
 - 3.2.5.1. Variation of Tops of Base Cabinets from Level: 1/16 inch in 10 feet.
 - 3.2.5.2. Variation of Faces of Cabinets from a True Plane: 1/8 inch in 10 feet.
 - 3.2.5.3. Variation of Adjacent Surfaces from a True Plane (Lippage): 1/32 inch.
 - 3.2.5.4. Variation in Alignment of Adjacent Door and Drawer Edges: 1/16 inch.
- 3.2.6. Base Cabinets: Fasten cabinets to service space framing and/or wall substrates, with fasteners spaced not more than 16 inches on center. Bolt adjacent cabinets together with joints flush, tight, and uniform.
- 3.2.7. Install hardware uniformly and precisely.
- 3.2.8. Countertops: Install countertops intended and furnished for field installation in one true plane, with ends abutting at hairline joints, and no raised edges.
- 3.2.9. Replace units that are damaged, including those that have damaged finishes.

3.3. ADJUSTING

- 3.3.1. Adjust operating parts, including doors, drawers, hardware, and fixtures to function smoothly.

3.4. CLEANING

- 3.4.1. Clean casework and other installed surfaces thoroughly.

3.5. PROTECTION

- 3.5.1. Do not permit finished casework to be exposed to continued construction activity.

- 3.5.2. Protect casework and countertops from ongoing construction activities. Prevent workmen from standing on, or storing tools and materials on casework or countertops.
- 3.5.3. Repair damage, including to finishes, that occurs prior to Date of Substantial Completion, using methods prescribed by manufacturer; replace units that cannot be repaired to like-new condition.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 12 35 30

RESIDENTIAL CASEWORK

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Kitchen cabinets.
- 1.1.2. Vanity cabinets.

1.2. RELATED REQUIREMENTS

- 1.2.1. Section 12 36 00 - Countertops.

1.3. REFERENCE STANDARDS

- 1.3.1. BHMA A156.9 - Cabinet Hardware; 2020.
- 1.3.2. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; 2024.
- 1.3.3. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

1.4. SUBMITTALS

- 1.4.1. Product Data: Provide component dimensions, configurations, construction details, and joint details.
- 1.4.2. Shop Drawings: Indicate casework locations, elevations, clearances required, rough-in and anchor placement dimensions and tolerances.
- 1.4.3. Manufacturer's Qualification Statement.

1.5. QUALITY ASSURANCE

- 1.5.1. Manufacturer: Company specializing in manufacturing the type of products specified in this section, with minimum five years of documented experience.

1.6. WARRANTY

- 1.6.1. Correct defective Work within a five year period after Date of Substantial Completion.

2. PART 2 PRODUCTS

2.1. CABINETS

- 2.1.1. Kitchen and Vanity Cabinets: Premanufactured and factory-finished, complying with construction and testing requirements in KCMA A161.1.
- 2.1.2. Cabinet Box: Framed construction.
 - 2.1.2.1. Side Panels: Plywood.
 - A. Exposed Side Panel Finish: Wood veneer, coordinate with cabinet door and drawer color/finish.
 - 2.1.2.2. Back Panel: Plywood.
 - 2.1.2.3. Bottom (and Top) Panel: Plywood.
 - 2.1.2.4. Face Frame: Solid wood.
 - 2.1.2.5. Interior Cabinet Finish: Thermally fused laminate.

- 2.1.2.6. Exposed Panel Edges: Finish with manufacturer's standard edge banding, color coordinated with other exposed finishes.
- 2.1.3. Cabinet Door/Drawer Configuration: Full overlay.
- 2.1.4. Cabinet Doors:
 - 2.1.4.1. Solid wood, painted finish.
 - 2.1.4.2. Paint Color: To be determined.
- 2.1.5. Drawers:
 - 2.1.5.1. Solid wood sides with dovetail joints, plywood bottom panel.
 - 2.1.5.2. Drawer Front: To match cabinet doors in style, material, and finish.
 - 2.1.5.3. Interior Finish: Manufacturer's standard.
- 2.1.6. Shelves: Manufacturer's standard adjustable shelves and shelf supports.
- 2.1.7. Cabinet Hardware: As selected from manufacturer's standard types, styles and finishes.
- 2.1.8. Countertops: As specified in Section 12 36 00.

2.2. MATERIALS

- 2.2.1. Adhesives Used for Assembly: Comply with VOC requirements for adhesives and sealants as specified in Section 01 61 16.
- 2.2.2. Wood-Based Materials:
 - 2.2.2.1. Solid Wood: Air-dried to 4.5 percent moisture content, then tempered to 6 percent moisture content before use.
 - 2.2.2.2. Composite Wood Panels: Containing no urea-formaldehyde resin binders.
- 2.2.3. Solid Wood: Clear, dry, sound, plain sawn, selected for species grain and color, no defects.
- 2.2.4. Semi-Exposed Solid Wood: Dry, sound, plain sawn, no appearance defects, any species similar in color and grain to exposed portions.
- 2.2.5. Hardwood Plywood: Veneer core; HPVA HP-1 Grade as indicated; same species as exposed solid wood, clear, compatible grain and color, no defects. Band exposed edges with solid wood of same species as veneer.
- 2.2.6. Concealed Solid Wood or Plywood: Any species and without defects affecting strength or utility.
- 2.2.7. Thermally Fused Laminate (TFL): Melamine resin, NEMA LD 3, Type VGL laminate panels.

2.3. FABRICATION

- 2.3.1. Shop assemble casework for delivery to site in units easily handled and to permit passage through building openings.
- 2.3.2. Fabricate corners and joints without gaps.
- 2.3.3. Fabricate each unit to be rigid and not dependent on adjacent units for rigidity.
- 2.3.4. Provide cutouts for plumbing fixtures and appliances. Prime paint contact surfaces of cut edges.
- 2.3.5. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Verify adequacy of support framing.

3.2. INSTALLATION

- 3.2.1. Install casework, components and accessories in accordance with manufacturer's instructions.
- 3.2.2. Use anchoring devices to suit conditions and substrate materials encountered.
- 3.2.3. Set casework items plumb and square, securely anchored to building structure.
- 3.2.4. Carefully scribe casework abutting other components, with maximum gaps of 1/8 inch.

3.3. ADJUSTING

3.3.1. Adjust doors, drawers, hardware, and other moving or operating parts to function smoothly.

3.4. CLEANING

3.4.1. Clean casework, countertops, shelves, and hardware.

3.5. PROTECTION

3.5.1. Do not permit finished casework to be exposed to continued construction activity.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 12 36 00 COUNTERTOPS

1. PART 1 GENERAL

1.1. REFERENCE STANDARDS

- 1.1.1. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- 1.1.2. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
- 1.1.3. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.
- 1.1.4. IAPMO Z124 - Plastic Plumbing Fixtures; 2022, with Editorial Revision.
- 1.1.5. ISFA 2-01 - Classification and Standards for Solid Surfacing Material; 2013.
- 1.1.6. ISFA 3-01 - Classification and Standards for Quartz Surfacing Material; 2013.
- 1.1.7. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.
- 1.1.8. NSI (DSDM) - Dimensional Stone Design Manual, Version VIII; 2016.
- 1.1.9. PS 1 - Structural Plywood; 2023.

1.2. SUBMITTALS

- 1.2.1. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1.2.1.1. Preparation instructions and recommendations.
 - 1.2.1.2. Storage and handling requirements and recommendations.
 - 1.2.1.3. Specimen warranty.
- 1.2.2. Shop Drawings: Complete details of materials and installation ; combine with shop drawings of cabinets and casework specified in other sections.
- 1.2.3. Test Reports: Chemical resistance testing, showing compliance with specified requirements.

1.3. QUALITY ASSURANCE

- 1.3.1. Fabricator Qualifications: Natural Stone Institute (NSI) Accredited Natural Stone Fabricator; www.naturalstoneinstitute.org/#sle.
- 1.3.2. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience.

1.4. DELIVERY, STORAGE, AND HANDLING

- 1.4.1. Store products in manufacturer's unopened packaging until ready for installation.
- 1.4.2. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.5. FIELD CONDITIONS

- 1.5.1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

2. PART 2 PRODUCTS

2.1. COUNTERTOPS

- 2.1.1. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
- 2.1.2. Solid Surfacing Countertops: Solid surfacing sheet or plastic resin casting self-supporting over structural members.
 - 2.1.2.1. Flat Sheet Thickness: 1/2 inch, minimum.
 - 2.1.2.2. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISFA 2-01 and NEMA LD 3; acrylic or polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
 - A. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
 - B. NSF approved for food contact.
 - C. Sinks and Bowls: Integral castings; minimum 3/4 inch wall thickness; comply with IAPMO Z124.
 - D. Finish on Exposed Surfaces: Matte, gloss rating of 5 to 20.
 - E. Color and Pattern: As selected by Alba Architects from manufacturer's full line.
 - 2.1.2.3. Other Components Thickness: 1/2 inch, minimum.
 - 2.1.2.4. Exposed Edge Treatment: Built up to minimum 1-1/4 inch thick; square edge; use marine edge at sinks.
 - 2.1.2.5. Back and End Splashes: Same sheet material, square top; minimum 4 inches high.
- 2.1.3. Natural Stone Countertops: Stone slabs bonded to substrate; use as large pieces as possible with inconspicuous adhesive joints.
 - 2.1.3.1. Stone: Granite without cracks, voids, or pin holes ; filling with matching epoxy resin is acceptable.
 - 2.1.3.2. Color: To be determined.
 - 2.1.3.3. Quarry Name: To be determined; no substitutions.
 - 2.1.3.4. Stone Thickness: 1/2 inch, minimum.
 - 2.1.3.5. Surface Finish: Honed, non-glare.
 - 2.1.3.6. Exposed Edge Treatment: Square profile stone, 1 inch thick, with 3/16 inch radius corner.
 - 2.1.3.7. Back and End Splashes: Same material, same thickness; for field attachment.
- 2.1.4. Natural Quartz and Resin Composite Countertops: Sheet or slab of natural quartz and plastic resin over continuous substrate.
 - 2.1.4.1. Flat Sheet Thickness: 1-1/4 inch, minimum.
 - 2.1.4.2. Natural Quartz and Resin Composite Sheets, Slabs and Castings: Complying with ISFA 3-01 and NEMA LD 3; orthophthalic polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard stone fabrication tools; no surface coating; color and pattern consistent throughout thickness.
 - A. Factory fabricate components to the greatest extent practical in sizes and shapes indicated; comply with NSI (DSDM).
 - B. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
 - C. Sinks: Separate units for undercounter mounting; minimum 3/4 inch wall thickness; comply with IAPMO Z124.
 - D. Finish on Exposed Surfaces: Polished.
 - E. Color and Pattern: As selected by Alba Architects from manufacturer's full line.

- 2.1.4.3. Other Components Thickness: 3/4 inch, minimum.
- 2.1.4.4. Exposed Edge Treatment: Built up to minimum 1-1/4 inch thick; square edge; use marine edge at sinks.
- 2.1.4.5. Back and End Splashes: Same sheet material, square top; minimum 4 inches high.
- 2.1.5. Natural Quartz and Resin Composite Wall Panels: Sheet or slab of natural quartz and plastic resin over continuous substrate.
 - 2.1.5.1. Flat Sheet Thickness: 1/2 inch thick.
 - 2.1.5.2. Natural Quartz and Resin Composite Sheets, Slabs and Castings: Complying with ISFA 3-01 and NEMA LD 3; orthophthalic polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard stone fabrication tools; no surface coating; color and pattern consistent throughout thickness.
 - A. Factory fabricate components to the greatest extent practical in sizes and shapes indicated; comply with NSI (DSDM).
 - B. Finish on Exposed Surfaces: Polished.
 - C. Color and Pattern: As selected by Alba Architects from manufacturer's full line.

2.2. FABRICATION

- 2.2.1. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
 - 2.2.1.1. Join lengths of tops using best method recommended by manufacturer.
 - 2.2.1.2. Fabricate to overhang fronts and ends of cabinets 1 inch except where top butts against cabinet or wall.
 - 2.2.1.3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.
- 2.2.2. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
 - 2.2.2.1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
 - 2.2.2.2. Height: 4 inches, unless otherwise indicated.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Do not begin installation until substrates have been properly prepared.
- 3.1.2. If substrate preparation is the responsibility of another installer, notify Alba Architects of unsatisfactory preparation before proceeding.
- 3.1.3. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

3.2. PREPARATION

- 3.2.1. Clean surfaces thoroughly prior to installation.
- 3.2.2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3. INSTALLATION

- 3.3.1. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.
- 3.3.2. Seal joint between back/end splashes and vertical surfaces.

3.4. TOLERANCES

- 3.4.1. Variation From Horizontal: 1/8 inch in 10 feet, maximum.
- 3.4.2. Offset From Wall, Countertops: 1/8 inch maximum; 1/16 inch minimum.
- 3.4.3. Field Joints: 1/8 inch wide, maximum.

3.5. CLEANING

- 3.5.1. Clean countertops surfaces thoroughly.

3.6. PROTECTION

- 3.6.1. Protect installed products until completion of project.
- 3.6.2. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 14 24 00

HYDRAULIC ELEVATORS

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Complete hydraulic elevator systems.
 - 1.1.1.1. Passenger type.

1.2. REFERENCE STANDARDS

- 1.2.1. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; Current Edition.
- 1.2.2. AAMA 611 - Specification for Anodized Architectural Aluminum; 2024.
- 1.2.3. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.
- 1.2.4. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- 1.2.5. AISC 360 - Specification for Structural Steel Buildings; 2022, with Errata (2025).
- 1.2.6. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2015 (Reaffirmed 2020).
- 1.2.7. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
- 1.2.8. ASME A17.1 - Safety Code for Elevators and Escalators Includes Requirements for Elevators, Escalators, Dumbwaiters, Moving Walks, Material Lifts, and Dumbwaiters with Automatic Transfer Devices; 2022.
- 1.2.9. ASME A17.2 - Guide for Inspection of Elevators, Escalators, and Moving Walks Includes Inspection Procedures for Electric Traction and Winding Drum Elevators, Hydraulic Elevators, Inclined Elevators, Limited-Use/Limited-Application Elevators, Private Residence Elevators, Escalators, Moving Walks, Dumbwaiters, and Material Lifts; 2023.
- 1.2.10. ASME QE1-1 - Standard for the Qualification of Elevator Inspectors; 2024.
- 1.2.11. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- 1.2.12. ASTM A139/A139M - Standard Specification for Electric-Fusion (Arc)-Welded Steel Pipe (NPS 4 and Over); 2022.
- 1.2.13. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2024.
- 1.2.14. ASTM B36/B36M - Standard Specification for Brass Plate, Sheet, Strip, and Rolled Bar; 2023.
- 1.2.15. ASTM B135/B135M - Standard Specification for Seamless Brass Tube; 2017.
- 1.2.16. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.
- 1.2.17. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.
- 1.2.18. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2025.
- 1.2.19. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2025.
- 1.2.20. ITS (DIR) - Directory of Listed Products; Current Edition.
- 1.2.21. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.
- 1.2.22. NFPA 13 - Standard for the Installation of Sprinkler Systems; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

- 1.2.23. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- 1.2.24. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2025.
- 1.2.25. PS 1 - Structural Plywood; 2023.
- 1.2.26. UL (DIR) - Online Certifications Directory; Current Edition.

1.3. ADMINISTRATIVE REQUIREMENTS

- 1.3.1. Coordination:
 - 1.3.1.1. Coordinate work with other installers to provide conduits necessary for installation of wiring including but not limited to:
 - A. Elevator equipment devices remote from elevator machine room or hoistway.
 - B. Remote group automatic panel in lobby from controller cabinet.
 - C. Telephone service for machine room.
 - D. Elevator pit for lighting and sump pump.
 - E. Fire alarm panel from controller cabinet.
- 1.3.2. Construction Use of Elevator: Not permitted.

1.4. SUBMITTALS

- 1.4.1. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- 1.4.2. Product Data: Submit data on following items:
 - 1.4.2.1. Signal and operating fixtures, operating panels, and indicators.
 - 1.4.2.2. Car design, dimensions, layout, and components.
 - 1.4.2.3. Car and hoistway door and frame details.
 - 1.4.2.4. Electrical characteristics and connection requirements.
- 1.4.3. Shop Drawings: Include appropriate plans, elevations, sections, diagrams, and details on following items:
 - 1.4.3.1. Elevator Equipment and Machines: Size and location of driving machines, power units, controllers, governors, and other components.
 - 1.4.3.2. Hoistway Components: Size and location of car guide rails, buffers, jack unit and other components.
 - 1.4.3.3. Rail bracket spacing; maximum loads imposed on guide rails requiring load transfer to building structural framing.
 - 1.4.3.4. Clearances and over-travel of car.
 - 1.4.3.5. Locations in hoistway and machine room of traveling cables and connections for car lighting and telephone.
 - 1.4.3.6. Location and sizes of hoistway and car doors and frames.
 - 1.4.3.7. Interface with building security system.
 - 1.4.3.8. Electrical characteristics and connection requirements.
 - 1.4.3.9. Indicate arrangement of elevator equipment and allow for clear passage of equipment through access openings.
- 1.4.4. Testing Agency's Qualification Statement.
- 1.4.5. Specimen warranty.
- 1.4.6. Executed warranty.

1.5. QUALITY ASSURANCE

- 1.5.1. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum ten years documented experience.
- 1.5.2. Installer Qualifications: Trained personnel and supervisor on staff of elevator equipment manufacturer.

- 1.5.3. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of type specified in this section.

1.6. WARRANTY

- 1.6.1. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- 1.6.2. Manufacturer Warranty: Provide 1-year manufacturer warranty for elevator operating equipment and devices. Complete forms in Whitefield Library's name and register with manufacturer.

2. PART 2 PRODUCTS

2.1. MANUFACTURERS

- 2.1.1. Source Limitations: Provide elevator and associated equipment and components produced by the same manufacturer as the other elevator equipment used for this project and obtained from a single supplier.

2.2. HYDRAULIC ELEVATORS

- 2.2.1. Hydraulic Passenger Elevator:
 - 2.2.1.1. Hydraulic Elevator Equipment:
 - 2.2.1.2. Drive System:
 - 2.2.1.3. Operation Control Type:
 - 2.2.1.4. Service Control Type:
 - A. Standard service control only.
 - 2.2.1.5. Interior Car Height: 96 inch.
 - 2.2.1.6. Electrical Power: 480 volts; alternating current (AC); three phase; 60 Hz.
 - 2.2.1.7. Rated Net Capacity: 1400 pounds.
 - 2.2.1.8. Rated Speed: 30 feet per minute.
 - 2.2.1.9. Hoistway Size: As indicated on drawings.
 - 2.2.1.10. Interior Car Platform Size: As indicated on drawings.
 - 2.2.1.11. Elevator Pit Depth: 24 inch.
 - 2.2.1.12. Overhead Clearance at Top Floor: 136 inch.
 - 2.2.1.13. Travel Distance: As indicated on drawings.
 - 2.2.1.14. Number of Stops: As indicated on drawings.
 - 2.2.1.15. Number of Openings: 1 Front.
 - 2.2.1.16. Hydraulic Equipment Location: As indicated on drawings

2.3. COMPONENTS

- 2.3.1. Elevator Equipment:
 - 2.3.1.1. Motors, Hydraulic Equipment, Controllers, Controls, Buttons, Wiring, Devices, and Indicators: Comply with NFPA 70.
 - 2.3.1.2. Guide Rails, Cables, Buffers, Attachment Brackets and Anchors: Design criteria for components includes safety factors in accordance with applicable requirements of Elevator Code, ASME A17.1.
 - 2.3.1.3. Buffers:
 - 2.3.1.4. Lubrication Equipment:

2.4. PERFORMANCE REQUIREMENTS

- 2.4.1. Regulatory Requirements: Comply with ASME A17.1, applicable local codes, and authorities having jurisdiction (AHJ).

- 2.4.2. Accessibility Requirements: Comply with ADA Standards.
- 2.4.3. Perform structural steel design, fabrication, and installation in accordance with AISC 360.
- 2.4.4. Comply with seismic design requirements in accordance with ASME A17.1, applicable local codes, and authorities having jurisdiction (AHJ).
 - 2.4.4.1. Complying with Elevator Safety Requirements for Seismic Risk Zone in accordance with ASME A17.1, ASCE 7 and other related requirements.
 - 2.4.4.2. Provide earthquake emergency operations in accordance with ASME A17.1 requirements.
- 2.4.5. Perform welding of steel in accordance with AWS D1.1/D1.1M.
- 2.4.6. Fabricate and install door and frame assemblies in accordance with NFPA 80 and in compliance with requirements of authorities having jurisdiction.
- 2.4.7. Perform electrical work in accordance with NFPA 70.
- 2.4.8. Comply with venting or pressurization of hoistway design in accordance with HVAC system requirements and authorities having jurisdiction (AHJ).
- 2.4.9. Comply with fire protection sprinkler system of hoistway design in accordance with NFPA 13 requirements and authorities having jurisdiction (AHJ).

2.5. OPERATION CONTROLS

- 2.5.1. Elevator Controls: Provide landing operating panels and landing indicator panels.
 - 2.5.1.1. Landing Operating Panels: Metallic type, one for originating "Up" and one for originating "Down" calls, one button only at terminating landings; with illuminating indicators.
 - 2.5.1.2. Landing Indicator Panels: Illuminating.
 - 2.5.1.3. Comply with ADA Standards for elevator controls.
- 2.5.2. Interconnect elevator control system with building security, fire alarm, smoke alarm, and building management control systems.
- 2.5.3. Door Operation Controls:
 - 2.5.3.1. Program door control to open doors automatically when car arrives at floor landing.
 - 2.5.3.2. Render "Door Close" button inoperative when car is standing at dispatch landing with doors open.
 - 2.5.3.3. Door Safety Devices: Moveable, retractable safety edges, quiet in operation; equipped with photo-electric light rays.
- 2.5.4. Lobby Monitoring Panel:
 - 2.5.4.1. Locate status indicator and control panel for each individual elevator and group of elevators as indicated on drawings.
 - 2.5.4.2. Etch face plate markings in panel, and fill with paint of contrasting color.
 - 2.5.4.3. Include direction indicator displaying landing "Up" and "Down" calls registered at each landing floor.
 - 2.5.4.4. Include position and motion display for direction of travel of each elevator. Display appropriate graphic characters on non-glare screen. Indicate position of cars at rest and in motion.
 - 2.5.4.5. Include a "Remove From In Service" switch for each elevator that then calls car to ground floor and parks car with doors open.
 - 2.5.4.6. Include "Firefighter's Service Switch" that manually recalls each elevator to main floor.
- 2.5.5. Provide "Firefighter's Emergency Operation" in accordance with ASME A17.1, applicable building codes, and authorities having jurisdiction (AHJ).

2.6. OPERATION CONTROL TYPE

- 2.6.1. Single Automatic (Push Button) Operation Control: Applies to car in single elevator shaft.
 - 2.6.1.1. Refer to description provided in ASME A17.1.

- 2.6.1.2. Set system operation so that momentary pressure of landing button dispatches car from other landing to that landing.
- 2.6.1.3. Allow call registered by momentary pressure of landing button at any time to remain registered until car stops in response to that landing call.
- 2.6.1.4. If elevator car door is not opened within predetermined period of time after car has stopped at terminal landing allow car to respond to call registered from other landing.

2.7. MATERIALS

- 2.7.1. Steel Cylinder Casing: ASTM A139/A139M, Grade A steel.
- 2.7.2. Rolled Steel Sections, Shapes, Rods: ASTM A36/A36M.
- 2.7.3. Steel Sheet: ASTM A1008/A1008M, Designation CS (commercial steel), with matte finish.
- 2.7.4. Extruded Aluminum: ASTM B221 (ASTM B221M), natural anodized finish unless otherwise indicated.
- 2.7.5. Plywood: PS 1, Structural I, Grade C-D or better, sanded.
- 2.7.6. Tempered Glass: 3/8 inch minimum thickness, fully tempered in compliance with ASME A17.1, 16 CFR 1201, ANSI Z97.1, and ASTM C1048 tempered glass requirements.
- 2.7.7. Resilient Flooring: Vinyl tile flooring and Resilient base, see Section 09 65 00.
- 2.7.8. Plastic Laminate: NEMA LD 3, Type HGS, color as selected by Alba Architects from manufacturer's standard line of colors.

2.8. CAR AND HOISTWAY ENTRANCES

- 2.8.1. Elevator:
 - 2.8.1.1. Car and Hoistway Entrances:
 - A. Hoistway Fire Rating: 1 Hour.
 - B. Elevator Door Fire Rating: 1 Hour.
 - C. Framed Opening Finish and Material: Alkyd enamel on steel.
 - D. Car Door Material: Powder coat on steel, with rigid sandwich panel construction.
 - E. Hoistway Door Material: Powder coat on steel, with rigid sandwich panel construction.

2.9. CAR EQUIPMENT AND MATERIALS

- 2.9.1. Elevator Car:
 - 2.9.1.1. Car Operating Panel: Provide main and auxiliary; flush-mounted applied face plate, with illuminated call buttons corresponding to floors served with "Door Open/Door Close" buttons, "Door Open" button, "Door Close" button, and alarm button.
 - A. Panel Material: Integral with front return; one per car.
 - B. Car Floor Position Indicator: Above door with illuminating position indicators.
 - C. Locate alarm button where it is unlikely to be accidentally actuated; not more than 54 inch above car finished floor.
 - 2.9.1.2. Ventilation: Single speed fan with grille in ceiling.
 - 2.9.1.3. Flooring: Resilient vinyl tile.
 - 2.9.1.4. Front Return Panel: Match material of car door.
 - 2.9.1.5. Door Wall: Plastic laminate on plywood.
 - 2.9.1.6. Hand Rail: Aluminum, at all three sides. Provide open clearance space 1-1/2 inch (38 mm) wide to face of wall.
 - A. Aluminum Finish: Clear anodized.
 - 2.9.1.7. Ceiling:
 - A. Canopy Ceiling: Plastic laminate on plywood.
- 2.9.2. Car Accessories:

- 2.9.2.1. Certificate Frame: Stainless steel frame glazed with tempered glass, and attached with tamper-proof screws.

2.10. FINISHES

- 2.10.1. Powder Coat on Steel: Clean and degrease metal surface; apply one coat of primer; two coats of powder coat.
- 2.10.2. Finish Paint for Metal Surfaces: Alkyd enamel, semi-gloss, color as selected, complying with VOC limitations of authorities having jurisdiction (AHJ).
- 2.10.3. Clear Anodized Finish: Class I, AAMA 611 AA-M12C22A41, clear anodic coating with electrolytically deposited organic seal; not less than 0.7 mil, 0.0007 inch thick.

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Verify existing conditions before starting this work.
- 3.1.2. Verify that hoistway, pit, and machine room are ready for work of this section.
- 3.1.3. Verify hoistway shaft and openings are of correct size and within tolerance.
- 3.1.4. Verify location and size of machine foundation and position of machine foundation bolts.
- 3.1.5. Verify that electrical power is available and of correct characteristics.

3.2. PREPARATION

- 3.2.1. Arrange for temporary electrical power for installation work and testing of elevator components; see Section 01 50 00 - Temporary Facilities and Controls for additional requirements.
- 3.2.2. Maintain elevator pit excavation free of water.

3.3. INSTALLATION

- 3.3.1. Coordinate this work with installation of hoistway wall construction.
- 3.3.2. Install system components, and connect equipment to building utilities.
- 3.3.3. Provide conduit, electrical boxes, wiring, and accessories; see Sections 26 05 33.13 and 26 05 83.
- 3.3.4. Install hydraulic piping between cylinder and pump unit.
- 3.3.5. Mount machines, motors, and pumps on vibration and acoustic isolators.
 - 3.3.5.1. Place on structural supports and bearing plates.
 - 3.3.5.2. Securely fasten to building supports.
 - 3.3.5.3. Prevent lateral displacement.
- 3.3.6. Install hoistway, elevator equipment, and components in accordance with approved shop drawings.
- 3.3.7. Install guide rails to allow for thermal expansion and contraction movement of guide rails.
- 3.3.8. Accurately machine and align guide rails, forming smooth joints with machined splice plates.
- 3.3.9. Install hoistway door sills, frames, and headers in hoistway walls; grout sills in place, set hoistway floor entrances in alignment with car openings, and align plumb with hoistway.
- 3.3.10. Structural Metal Surfaces: Clean surfaces of rust, oil or grease; wipe clean with solvent; prime two coats.
- 3.3.11. Wood Surfaces not Exposed to Public View: Finish with one coat primer; one coat enamel.
- 3.3.12. Adjust equipment for smooth and quiet operation.

3.4. TOLERANCES

- 3.4.1. Guide Rail Alignment: Plumb and parallel to each other in accordance with ASME A17.1 and ASME A17.2.

- 3.4.2. Car Movement on Aligned Guide Rails: Smooth movement, without any objectionable lateral or oscillating movement or vibration.

3.5. FIELD QUALITY CONTROL

- 3.5.1. See Section 01 40 00 - Quality Requirements for additional requirements.
- 3.5.2. Perform testing and inspection in accordance with requirements.
- 3.5.3. Operational Tests:
 - 3.5.3.1. Perform operational tests in the presence of Whitefield Library and Alba Architects.
 - 3.5.3.2. At an agreed time, and the building occupied with normal building traffic, conduct tests to verify performance.
 - A. Furnish event recording of each landing call registrations, time initiated, and response time throughout entire working day.

3.6. ADJUSTING

- 3.6.1. Adjust for smooth acceleration and deceleration of car to minimize passenger discomfort.
- 3.6.2. Adjust with automatic floor leveling feature at each floor landing to reach 1/4 inch maximum from flush with sill.

3.7. CLEANING

- 3.7.1. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements.
- 3.7.2. Remove protective coverings from finished surfaces.
- 3.7.3. Clean surfaces and components in accordance with manufacturers written instructions.

3.8. CLOSEOUT ACTIVITIES

- 3.8.1. See Section 01 78 00 - Closeout Submittals for closeout submittals.
- 3.8.2. See Section 01 79 00 - Demonstration and Training for additional requirements.
- 3.8.3. Demonstrate proper operation of equipment to Whitefield Library's designated representative.

3.9. PROTECTION

- 3.9.1. Do not permit construction traffic within car after cleaning.
- 3.9.2. Protect installed products until Date of Substantial Completion.
- 3.9.3. Touch-up, repair, or replace damaged products and materials prior to Date of Substantial Completion.

END OF SECTION

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 22 0500

PLUMBING GENERAL REQUIREMENTS

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. Related Work Specified Elsewhere:

1. Refer to all Sections of DIVISION 1 - GENERAL REQUIREMENTS, which are hereby made part of this Section of the Specifications.
2. Excavation and Backfill are specified in Division 31.
3. Concrete Work is specified in Division 3.
4. Flashing of Mechanical Work passing through membrane roof is specified in Division 7.
5. Finish Painting is specified in Division 9.
6. Mechanical Work is specified in Division 23.
7. Electrical Work is specified in Division 26.

B. Related Documents:

1. The General Provisions of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in this Section.
2. The requirements of Section 22 0500 govern the work specified in this Section, where applicable.

C. Reference to Drawings: All work to be performed is shown on Drawings listed at the end of this Section:

1. This Contractor shall refer to the Drawings for a full comprehension of the work to be done and for conditions affecting the location and placement of equipment and materials. These Drawings are intended to be supplementary to the specifications and any work indicated, mentioned, or implied in either is to be considered as specified by both. Should the character of the work herein contemplated or any matter pertaining thereto not sufficiently explained in the specifications or drawings, this Contractor may apply to the Architect/Engineer for further information and shall conform to such when given, as it may be consistent with the original intent. The Architect/Engineer reserves the right to make any reasonable changes in location prior to installation at no expense to the Owner. All lines are diagrammatic, and exact locations are subject to the approval of the Architect/Engineer.
2. Before submitting his Bid, this Contractor shall visit the site with the plans and specifications and shall become thoroughly familiar with all conditions affecting his work since the Contractor will be held responsible for any assumptions they may make in regard thereto.
3. This Contractor shall, at all times, have a foreman or superintendent on the project authorized to make decisions and receive instructions as if the Contractor himself were present. The foreman or superintendent shall not be removed or replaced without the express approval of the Architect/Engineer after construction work begins.

4. This Contractor shall employ competent and experienced workmen at a regular schedule in harmony with the other tradesmen on the job. The Contractor shall also exercise care and supervision of his employees in regard to proper and expeditious layout of his work.
- D. Extent: This specification applies to the renovations and additions at the Whitefield Public Library in Whitefield, New Hampshire. The plumbing work required without limiting the generality thereof, includes the furnishing of all labor, materials, equipment, and services necessary for and reasonably incidental to the complete installation of all domestic water piping, plumbing fixtures, sanitary waste piping, water heater, condensate drain piping, and accessories furnished by the owner or other suppliers including final connections, and all other materials, equipment, and labor necessary, whether or not such items are specifically indicated on the drawings or in the specifications, to complete all mechanical systems in all respects ready for continuous and trouble free operation.
- E. Intent: It is the intent of the Contract Documents to include all work and materials necessary for erecting complete, ready for continuous use all mechanical systems as shown on the accompanying drawings or as hereinafter described. These Drawings shall be taken in a sense as diagrammatic; sizes of pipes, etc., and methods of running them are shown, but it is not intended to show every offset and fitting nor every structural difficulty that will be encountered during the installation of the work.
- F. Refer to drawings for alternates affecting the plumbing work.

1.2 SUBMITTALS

- A. Refer to General Conditions for submittal provisions and procedures. Approval by the Architect/Engineer must be obtained prior to delivery of materials to the site.
- B. Shop Drawings: Within thirty (30) days of award of contract, the Mechanical Contractor shall submit, for approval, one electronic copy of a complete list of manufacturer's shop drawings, detail prints, and data sheets for all shop drawings required.
- C. Product Data: Submit one electronic copy for each class of material or equipment and include other data as may be required to show compliance with these specifications.
- D. Test Reports: Submit certified test laboratory reports as necessary to show compliance with requirements.
- E. Colors: Colors of all materials shall be as selected by the Architect/ Engineer from the standard color ranges of each manufacturer from samples submitted as per above.

1.3 QUALITY ASSURANCE

- A. Equality of Materials: Equality of materials or articles other than those named or described in this Section will be determined in accordance with the CONDITIONS OF THE CONTRACT.
- B. Tests: This Contractor agrees to accept as final the results of tests secured by a qualified testing laboratory engaged by the Owner. Tests will be conducted in accordance with the CONDITIONS OF THE CONTRACT.
- C. Products:

1. All materials shall be new, full-weight and first class in every respect, without defects, and designed to function properly in that portion of the work for which they are intended and with the same brand of manufacturers for each class of material or equipment.
2. Equality of material or equipment other than those named or described in this Section will be determined in accordance with the revisions of the Contract and as specified further herein.

1.4 REFERENCE STANDARDS

- A. The work shall be performed in such a manner as to conform to the Codes and Regulations governing such work, as may be required by Local and State Ordinances. This Contractor and his Subcontractors shall inform themselves of all State and Federal work safety rules and regulations, including the latest provisions of the Occupational Safety and Health Act of 1971 and all subsequent provisions. All workmen employed on the project shall be instructed in the requirements and shall observe same at all times.
- B. All work installed under these Plans and Specifications must be installed in strict accordance with the requirements of all local, state and other departments having jurisdiction, the utility companies, and with the requirements of the Underwriters' Laboratories, State Building Code, Vermont Department Public Safety, Fire Protection Regulations, N.F.P.A., Factory Mutual, and/or similar codes applied thereto. Where provisions of the Contract Documents conflict with any codes, or rules and regulations, the latter shall govern. Where the contract requirements are in excess of applicable codes, rules and regulations, the Contract provisions shall govern.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: This Contractor shall provide for the delivery of all his materials and fixtures to the building site when required so as to carry on his work efficiently and to avoid delaying his work and that of other trades.
- B. Storage and Handling: This Contractor shall, at all times, fully protect his work and materials from injury or loss by others. Any injury or loss which may occur shall be made good without expense to the Owner. The Contractor shall be responsible for the proper protection of all his materials until the building is accepted by the Owner.

1.6 PERMITS AND CODES

- A. This Contractor shall obtain and pay for all licenses and permits and shall pay for all fees and charges for the connection to outside services and use of property other than the site of the work for storage of materials or other purposes.
- B. Work under this Contract shall be installed to comply strictly with latest applicable editions of International Building Code, including Supplements thereto and local amendments if any, to current state codes, Underwriters' Laboratories Regulations, State of Vermont Plumbing Code including the latest amendments, National Fire Protection Association, ASHRAE Guide, National Electric Code and all codes, regulations, and requirements of all Municipal, State, Federal and other public or private authorities which have jurisdiction. In each case, codes, regulations and standards are minimum requirements and where the contract documents exceed these minimum conditions, the contractor shall comply with the more stringent requirements.

1.7 MATERIALS AND SUBSTITUTIONS

- A. All materials shall be new and conform to standards established in plans and specifications.
- B. Equipment, materials or items of other manufacturers, of equivalent design, quality and capacity, will be considered as substitutes to those specified or noted on the Drawings. Engineer reserves the right to reject any substitute offered for items specified or noted on Drawings.
- C. Substitute material and equipment, where requested or proposed by Contractor, shall be itemized and shall show cost to Owner whether it be an "addition" or "deduction" or "no change in cost" to the Base Bid price. It shall be held that no change in contract completion time will occur should Engineer elect to accept any alternate unless such time is specifically stated in the Contractor's Bid.
- D. Materials and equipment not approved shall not be used in construction.

1.8 WORKMANSHIP

- A. All work shall be executed in a workmanlike manner, presenting a neat, mechanical appearance when completed. Work not approved by Architect or Engineer shall be replaced by Contractor without additional charge to Owner. Align, level and adjust for satisfactory operation, install so that connecting and disconnecting of piping and accessories for inspection, operation, maintenance and repair. Minor deviations from indicated arrangements may be made as approved.
- B. Piping shall be run as straight and direct as possible, forming right angles or parallel lines with building walls and other pipes, neatly spaced. Check with other trades and prevent interference.
- C. Piping shall be cut and fabricated accurately according to measurements taken at the building.
- D. This Contractor shall perform his work so as to cause no delay or interference with the progress of the general construction of the building and the work of the other trades or subcontractors. Materials and equipment shall be installed as soon as conditions or construction permit. Confer with all other trades or Subcontractors as to location of pipes, ducts, conduit and apparatus to avoid interference during installation.

1.9 CLEANING AND ADJUSTMENT

- A. Each Contractor shall clear away all debris, surplus materials, etc., resulting from his work or operation, leaving the job and equipment furnished in a clean, first-class condition.
- B. Cleaning, Flushing and Inspecting: Clean, flush and inspect each piping system in accordance with requirements of Section 22 0501, Plumbing Basic Materials and Methods Section.
- C. Painting of materials and equipment furnished under the mechanical portion of the Contract will be done under the General Construction Contract. The Contractors shall, however, refinish and restore to the original condition and appearance, all equipment which has sustained damage to the manufacturer's enamel or paint finish. Materials and workmanship shall be equal to the requirements of the General Construction Contract.

1.10 CERTIFICATES, DOCUMENTS AND INSTRUCTIONS

- A. Certificates and documents listed below for the convenience of Owner and Contractors are required under Mechanical and Electrical Section of the specifications. Previous to final payment, Contractor shall deliver copies of all such certificates and documents to the Architect for approval:
 - 1. All test data specified to be submitted under "TEST".
 - 2. Operating and Maintenance instructions for mechanical and electrical equipment and systems.
 - 3. All approved shop drawings.

1.11 MISCELLANEOUS STEEL SUPPORTS

- A. See drawings and schedules for equipment and materials that need to be fastened to and/or supported by the structure. Furnish and install all necessary anchor bolts, inserts, steel beams, bars, bearing and leveling plates and incidental items as may be needed to install the work. Items to be built into masonry and concrete must be furnished to the respective trade at the proper time to be built-in and shall include instructions and templates for their installation, unless it is explicitly shown or specified otherwise.

1.12 REFERENCE STANDARDS AND INDUSTRY SPECIFICATIONS

- A. Any material or operation specified by reference to published specifications of a manufacturer, a society, an association, a code or other published standard, shall comply with requirements of the listed document which is current on date of receipt of Bids. In case of a conflict between referenced documents, the one having more stringent requirements shall govern. Any Contractor, when requested, shall furnish a sworn affidavit from the manufacturer certifying that materials and/or manufactured products delivered to the job meet the requirements specified. However, such affidavit shall not relieve the Contractor from responsibility of complying with any added requirements of the project specifications.
 - 1. International Building Code (IBC)
 - 2. American Society of Mechanical Engineers (ASME)
 - 3. Underwriters Laboratories (U.L.)
 - 4. American National Standards Institute, Inc. (ANSI)
 - 5. National Electrical Manufacturers Association (NEMA)
 - 6. American Society of Testing Materials (ASTM)
 - 7. National Electrical Code (NEC)
 - 8. National Fire Protection Association (NFPA)

1.13 WARRANTY

- A. The Contractor shall and hereby does warrant that all work executed and all plumbing equipment shall be free from defects of workmanship and materials for a period of one year from date of Substantial Completion of this work. The Contractor further agrees that he will, at his own expense, repair and replace all such defective work and all other work damaged thereby which becomes defective during the term of the Guarantee/Warranty.
- B. Use of plumbing systems shall not constitute Substantial Completion and shall not constitute the start of the specified guarantee period.

1.14 RECORD DRAWINGS

- A. Refer to General Conditions for Record Drawings.
- B. Record Drawings shall reflect all changes from the Contract Drawings whether by change order or by field conditions. Principal dimensions of concealed work, water hammer arrestors, trap primers, control valves, and for piping installation including all major risers, valves, shut-offs and drains. Valve numbers shall be added as soon as established.

1.15 OPERATION AND MAINTENANCE MANUALS

- A. After all final tests and adjustments have been completed, fully instruct the proper Owner's representative in all details of operation for equipment installed. Supply qualified personnel to operate equipment for sufficient length of time to assure that Owner's representative is properly qualified to take over operation and maintenance procedures.
- B. Furnish the Architect/Engineer, for their approval one electronic copy of an Operation and Maintenance Manual. Inscribe the following identification on the cover: the words OPERATION AND MAINTENANCE MANUAL, the name and location of the equipment or the building, the name of the Contractor, and the Contract number. The manual shall have a table of contents with tab sheets placed before each section. The instructions shall be legible and easily read, with large sheets of drawings folded in. The manuals shall be bound in hard binders or an approved equivalent.
- C. The manual shall include, at a minimum, the following information:
 - 1. Description of systems.
 - 2. Description of start-up, operation, and shutdown procedures for each item of equipment.
 - 3. Winter/summer changeover procedures.
 - 4. Schedule of adjustment, care, and routine maintenance for each item of equipment.
 - 5. Lubrication chart.
 - 6. Wiring and control diagrams with data to explain detailed operation and control of each item of equipment.
 - 7. Valve chart.
 - 8. List of recommended spare parts.
 - 9. Copies of all service contracts.
 - 10. List of all names, addresses, and phone numbers of all Subcontractors as well as the local representative for each item of equipment.
 - 11. Copies of all approved Shop Drawings.
 - 12. Copies of all Test Reports.
 - 13. All warranties for materials and equipment.
 - 14. All certificates of approval from applicable agencies for systems installed on this project.
 - 15. Complete Equipment start-up reports prepared by factory authorized technicians.
 - 16. List of all stock items and spare parts.

1.16 PROTECTION

- A. Work shall include protecting the work and material of all other trades from damage by work or workmen, and shall include making good all damage thus caused.
- B. The Contractor shall be responsible for work and equipment until finally inspected, tested, and accepted; protect work against theft, injury, or damage; and carefully store material and equipment

received on site which is not immediately installed. Close open ends of work with temporary covers or plugs during construction to prevent entry of obstructing or foreign material.

- C. Work includes receiving, unloading, un-crating, storing, protecting, setting in place, and connecting-up completely any equipment supplied. Work shall also include exercising special care in handling and protecting equipment and fixtures, and shall include the cost of replacing any of the equipment and fixtures which are missing or damaged by reason of mishandling or failure to protect on the part of the Mechanical Contractor.
- D. Equipment and material stored on the job site shall be protected from the weather, vehicles, dirt, and/or damage by workmen or machinery. Ensure that all electrical or absorbent equipment or material is protected from moisture during storage.

1.17 IDENTIFICATION OF EQUIPMENT AND PIPING SYSTEMS

- A. All equipment shall be identified with a 3" wide by 1" high black phenolic nameplate with 1/2" high white letters. Nomenclature shall be required to accurately identify its respective equipment. Nameplates shall be secured to the equipment with suitable screws.
- B. All piping systems shall be identified with direction of flow arrows and printed color-coded bands of plastic tape applied after finish painting of insulation and bare pipe. Letters to be not less than 1" high. Note color and working on valve tag chart. Pipe labels to be Seton Name Plate Corporation, Style B wrap around vinyl tape or other approved equal completely wrapped around the pipe and adhered to itself. Tape and label background colors shall conform to ASA recommendations.
- C. Piping shall be labeled as follows:
 - 1. Label all exposed piping which is not in the same room with major equipment at least once in each room through which the pipes pass, but never more than 15' between labels.
 - 2. Label all piping adjacent to major equipment and include zone or equipment numbers when there are two or more pieces of similar equipment.
 - 3. Direction of flow arrows shall be applied to piping adjacent to all labels and at each piece of equipment.
- D. Provide brass stamped valve tags for all valves, including service, (DHW) domestic hot water, (DHWR) domestic hot water recirculation (DCW) domestic cold water. All valves shall be numbered and recorded on the as-built drawings. A valve chart shall be prepared and shall be posted in frames in the mechanical room and a copy shall be included in all Operation and maintenance manuals.

1.18 REMOVALS

- A. Existing Plumbing work as shown on the demolition drawings shall be removed, recycled and/or legally disposed of. The contractor shall be responsible to field verify extent of removals prior to bidding.
- B. Obtain a list of any items which the Owner will salvage and deliver all such items to on-site location directed by the Owner.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 22 0500

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 22 0510

PLUMBING BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. Related Work Specified Elsewhere:
 - 1. Refer to all Sections of DIVISION 1 - GENERAL REQUIREMENTS, which are hereby made part of this Section of the Specifications.
 - 2. Excavation and Backfill are specified in Division 31.
 - 3. Concrete Work is specified in Division 3.
 - 4. Flashing of Mechanical Work passing through membrane roof is specified in Division 7.
 - 5. Finish Painting is specified in Division 9.
 - 6. Mechanical Work is specified in Division 23.
 - 7. Electrical Work is specified in Division 26.
- B. Related Documents:
 - 1. The General Provisions of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in this Section.
 - 2. The requirements of Section 22 0500 govern the work specified in this Section, where applicable.

1.2 GENERAL PROVISIONS

- A. Unless otherwise indicated, the materials to be furnished under this Contract shall be the standard products of manufacturers regularly engaged in the production of such equipment and shall be the manufacturer's latest standard design that complies with the Specification Requirements.
- B. Each major item of equipment shall have the manufacturer's name, address, serial and model numbers on a plate securely attached to the item. Each length of pipe fitting and device shall be labeled with the maker's name or symbol and weight or class of product.
- C. The Contractor shall obtain detailed information from the manufacturers of apparatus which he is to provide for the proper methods installation. He shall also obtain all information from the General Contractor and other subcontractors which may be necessary to facilitate his work and the completion of the whole project. The Contractor shall coordinate his work with the General Contractor. All work shall be installed in a manner and in locations approved by the Engineer.
- D. The Contractor shall keep himself fully informed as to the shape; size and position of all openings and foundations required for his apparatus and shall give full information to the General Contractor sufficiently in advance. He shall furnish all supports herein specified, so that the General Contractor

may build same in place. In the case of failure on the part of the Contractor to give proper information as noted above, he shall assume the cost of having the work done by others.

- E. All plumbing equipment shall be delivered to the site in the original sealed containers or packages bearing the manufacturer's name and brand designation. Piping shall be cleaned inside to remove dirt and loose scale, etc. Water piping shall be flushed out prior to testing of equipment. All open ends of pipe shall be capped or plugged during the construction period to prevent entrance of foreign materials. No pipe shall be installed outside of the building or in an exterior wall unless adequate provision is made to protect such pipe from freezing. Escutcheons shall be provided for all exposed piping passing through finished wall, floor or ceiling assemblies. The General Contractor shall at all times protect his work, materials and equipment from any loss or damage.
- F. All equipment and piping shall be supported from the building structure. In general, all equipment and piping shall be installed concealed above ceilings or in walls, except as otherwise noted on the Drawings.
- G. All motors, controls, and wiring provided from factory, shall be UL tested and labeled. All field installed 120 VAC control panels are also required to bare a UL label, for the tested assembly no field modifications to UL tested and labeled assemblies shall be permitted.

1.3 ELECTRICAL WORK

- A. Electrical equipment furnished by this Contractor and wired under Division 26, Electrical.
 - 1. Motors, magnetic starters with auxiliary contacts and other controls of devices for all packaged units.
 - 2. Disconnect switches when specified to be furnished with equipment.
- B. Electrical equipment furnished, installed and wired by this Contractor:
 - 1. Low voltage controls, including relays.
 - 2. Interlocking and low voltage control wiring between controls, motor starters, relays, motors, and miscellaneous controls.
 - 3. All wiring shall be in accordance with Division 26, Electrical.
- C. Electrical equipment furnished, installed and wired under Division 26 work. The Electrical Contractor shall furnish and mount a magnetic motor starter for each motor where motors are not factory furnished in a package which includes motor controls.
- D. Motors:
 - 1. Motors shall be designed voltage and phase shown on the drawings, 60 Hz power, except as otherwise shown on the Drawings. Unless otherwise specified or shown on the Drawings, all motors shall have open drip-proof frames, Class F insulation and continuous duty classification based on a 40 degree C ambient temperature.
 - 2. Motors shall be sized for the service intended and all motors shall have 1.15 service factor. The HP of the motors specified or shown on the Drawings is for guidance. The Contractor shall, at no extra charge to the Owner, make all necessary adjustments, including all electrical work for the equipment furnished by him. Prior to substantial completion, the Contractor shall verify all overloads for all motors furnished by him.

3. Motor Efficiencies for plumbing equipment shall meet or exceed the requirements of the 2011 Vermont Commercial Energy Standard.

1.4 TESTING OF SYSTEMS

A. General:

1. Each system shall be tested in accordance with the governing regulations and as specified herein. The Contractor shall furnish all certificates of compliance in triplicate to the Engineer.
2. Upon completion of fabrication and before enclosing, insulating or concealing in any way, all piping, mains and joints shall be tested for leaks at one and one-half their normal working pressures.
3. Provide test pumps, meters, gauges and other instruments and materials to test plumbing systems, as specified herein.
4. Before testing piping, remove or otherwise protect from damage all specialties and equipment not designed to withstand test pressures.
5. The Contractor shall notify the Engineer, in advance (min. 48 hours) of scheduled tests so that the Engineer may have a representative present during any or all tests. Repeat all tests, as required, to prove system tight and in perfect operating condition.
6. All pipe lines shall be blown or flushed clean before tests are conducted.
7. Testing may be done in sections to facilitate construction.
8. The Contractor must accommodate his testing operation to the progress of the project as a whole and correct all defects appearing under tests and repeat the tests until all parts of the work have withstood them successfully. Screwed piping shall be made tight without caulking. When the work is presented for acceptance, all valve stem packing must be new and without leaks and all gauges must be in place and reading accurately. The Contractor shall make and remove all temporary piping connections required for the test and shall dispose of test water and all wastes after tests. He shall leave all work in good order, ready for full use.

B. Water Systems:

1. All domestic cold, hot and recirculating piping shall be tested hydraulically at 150 psi at the lowest floor level, before fixtures are connected. Maintain test for four (4) hours with no appreciable drop in pressure.

C. Sanitary Waste and Vent Systems:

1. The new sanitary, waste and venting systems shall be tested when completely roughed-in, excepting fixture traps, by plugging or capping all outlets except stacks above the roof and filling the entire system with water. Plumbers testing plugs shall be used in openings where required. Minimum ten ft. (10') head above highest fixture level. The tests may be done using air and in sections to facilitate construction.

D. Condensate Drainage Systems:

1. The new shall be tested using compressed air a 10 PSIG.

E. Additional Testing Requirements: If during the process of installing the specified systems the Engineer requires additional independent testing to confirm conformance with these specification the contractor shall be responsible for paying for and providing all testing deemed appropriate by the Engineer.

Additional testing requirements will be invoked if there is a question relative to quality, workmanship or methods utilized during the installation of the work. The Engineer shall select and approve any or all independent testing agencies required for any and all such testing. The contractor shall also be responsible for all costs associated with removal and replacement of sections of the work required for testing.

1.5 OPERATING TESTS

- A. Conduct operational test of all systems, equipment devices and accessories.
- B. During operating test, arrange and pay for services of qualified and authorized representative of manufacturers of the equipment and controls, as directed by the Engineer. Included in this service will be instructions to the Owner or his representative of the operating and maintenance of respective equipment and controls.
- C. Test and set safety and relief valves to specified relief pressure.
- D. Test and adjust all gauges, thermostats, meters and other equipment, after installation, to assure accurate operation.
- E. Adjustments and tests shall be repeated until systems operate in accordance with Contract requirements.
- F. Engineer shall inspect operating tests only after Contractor has completed them satisfactorily and requested inspection.

PART 2 - PRODUCTS

2.1 PIPE AND FITTINGS

- A. General: Provide pipe and fittings of the type grade, size and weight indicated for each piping system as shown on the Drawings and specified here herein.
- B. All Domestic Water Distribution Piping: shall be type "L" hard copper tubing with wrought copper fittings for solder fitting assembly.
- C. At the contractor's option- for piping smaller than ¾" serving branch run outs 3/4" and smaller, located within the units and not above corridors, provide alternate, PEX tubing. Alternate PEX tubing shall be plumbed using Watts WaterPEX® cross-linked polyethylene pipe or approved equal, and all joints shall be made using Watts brass CrimpRing™ and/or poly-alloy CrimpRing™ fittings using either the Watts copper CrimpRing™ or stainless steel CinchClamp™ crimping methods as outlined in the Watts WaterPEX® Installation Guidelines. Tubing shall be rated 160psi @ 73.4°F. Tubing shall be color coded blue for cold water and red for hot water.
- D. Sanitary Waste and Vent Piping, and roof drainage piping shall be ASTM D-1785, and ASTM D-2665 schedule 40, PVC-DWV pipe. All joints shall be cut square, de-burred, cleaned and then primed with a colored solvent based primer. Use solvent based cement to welded fittings following primer application.

- E. Condensate Drainage Piping: Schedule 40 PVC, use drainage pattern fittings.
- F. Air Conditioning Condensate Drainage Piping: Schedule 40 CPVC, use drainage pattern fittings.
- G. Fittings:
 - 1. Copper pipe fitting shall be wrought copper solder joints, ANSI B-16.22, streamlined pattern joints and shall be made with "Silverbrite" lead free solder with non-corrosive flux.
 - 2. Cast-iron threaded fittings where required shall be ANSI B-16.4, class 125, standard pattern, for threaded joints. Threads shall conform to ANSI B-1.20.2.
 - 3. Malleable-iron threaded fittings where required shall be ANSI B-16.3, Class 300, standard pattern, for threaded joints. Threads shall conform to ANSI B-1.20.1.
 - 4. Cast bronze flanges where required shall be ANSI B-16.24, Class 300; raised ground face, bolts spot faced.
 - 5. Unions shall be of the same class and material as the pipe and fittings of the system in which they are installed.
 - 6. Dielectric unions: To prevent corrosion caused by dissimilar materials provide dielectric unions equal to Watts Series 3000, with materials to match piping system. Flanged dielectric fittings shall be equal to Watts Series 3100 with materials to match piping system.
 - 7. CPVC pressure piping shall use solvent weld fittings conforming to ASTM D 2466.
 - 8. Waste and vent PVC Fittings shall conform to ASTM D-2665 and shall be DWV fittings. Fittings and piping shall use solvent weld fittings. Use tinted primer for joining piping.

2.2 VALVES

- A. General:
 - 1. Except as otherwise indicated, provide factory-fabricated valves of the type, body material and pressure class indicated. Where type or body material is not indicated, provide proper selection as determined by Installer for installation requirements, with pressure class selected from MSS or ANSI Standards based on the maximum pressure and temperature in the piping system. Except as otherwise indicated, provide valve size same as connecting pipe size.
 - 2. For information only, submit two (2) copies of manufacturer's product data including dimensions, sizes, end connections, weights and installation instructions. Include instructions on repacking and repairing valves.
 - 3. Valves shall be Watts, Milwaukee or Apollo. Valve type and numbers noted herein establish standard of type and quality. Valves 3" and larger shall have flanged ends; 2-1/2" and smaller have screwed ends for screwed piping and solder joint ends for copper tube piping. Provide valves for services listed below and of the following types.
- B. Domestic Water Service:
 - 1. NOTE: ALL VALVES TO BE LEAD FREE.
 - 2. Ball Valves: Ball valves for plumbing service shall be equal to Watts No. LFB-6000, bronze body, or an approved equal, 600 lb. W.O.G., chrome plated ball and stem, extended handle to accommodate insulation thickness, PTFE seat and seals, screwed ends or B-6001 sweat ends, virgin PTFE seats and seals. Check Valves: Watts series CVS, solder ends, series CV screwed ends, bronze body, 200 lb. W.O.G.
 - 3. Drain Valves: Watts No. LFB-6000, or an approved equal, bronze body, chrome plated ball and stem, screwed ends, No. B-6001 sweat ends. Provide cap and chain, with 1/2" I.P.S. to 3/4" hose.

4. Balancing Valves: Bell and Gossett, or an approved equal, lead free, with temperature/pressure readout ports, valve to be sized based on terminal flow rate. Handle shall be lockable type with memory stop.

2.3 SPECIALTIES

- A. Furnish and install pipe line type thermometers where specified and/or shown on the Drawings.
- B. Thermometers shall be H.O. Trerice Catalog No. A40507 or approved equal, with 9" scale, adjustable angle, and separable socket.
- C. Thermometers shall be installed so as to be easily read while standing on the floor.
- D. Furnish and install pressure gauges where specified and/or shown on the Drawings. Gauges shall be Trerice No. 450B with 4-1/2" dial, range as shown or approved equal to U.S. Gage or Crosby-Ashton. Each gauge shall be provided with a 1/4" ball valve gauge isolation valve. Gauges shall be installed so as to be easily read while standing on the floor. Provide pulsation dampener.
- E. Provide thermometers for each hot water supply line leaving the water heater.

2.4 SUPPORTING DEVICES

- A. General: All piping shall be rigidly supported from the building structure by means of approved hangers and supports. This Contractor shall furnish and install all necessary intermediate support steel and the proper hanging of all piping and equipment. Chains, strap, perforated bar or wire hangers shall not be permitted. Hangers for insulated piping shall be installed outside of insulation and provided with insulation protection saddles. Saddle shall be 12" long, 1/2 the circumference in width and 16 gauge for pipe 3" and larger and 6" long by 20 gauge for pipe 2-1/2" and smaller.
- B. All support components shall conform to Manufacturer's Standardization Society Specification SP-58. The hangers shall adequately support the piping system. They shall be located near or at changes in piping direction and at concentrated loads. They shall provide vertical adjustments to maintain pitch required for proper drainage and allow for expansion and contraction of the piping.
- C. Hangers shall be constructed of malleable or wrought iron. Where in contact with pipe hangers supporting copper pipe shall be copper-plated.
- D. Install all hangers straight and true, and in perfect alignment. Locate no hangers near couplings, fittings or bends in piping without making provisions for expansion.
- E. Where groups of three or more pipes occur, they may be supported with trapeze hangers, using two hangers as specified, with a capped pipe cross member.
- F. For vertical piping, support steel and copper pipe at every floor, with MSS Type 8 riser clamp.
- G. All pipe hangers shall be large enough to encompass the insulation, using a metal galvanized shield, so that vapor barrier jacket will not be broken or crushed.

H. Inserts in the concrete slab shall be drilled in by the Contractor. Inserts driven in by explosive charges shall not be permitted. Inserts shall be of the type to receive a machine bolt or threaded rod.

I. Provide insulation saddles as required herein.

J. Hangers for horizontal hanging piping shall be as follows:

1.	Copper Piping:	
	PIPE SIZE	MSS TYPE
	2" and Larger	Adjustable Clevis, Type 7
	1-1/2" and Smaller	Split Ring, Type 6 or 12
2.	PVC Piping:	
	PIPE SIZE	MSS TYPE
	2" and Larger	Adjustable Clevis, Type 7
	1-1/2" and Smaller	Split Ring, Type 6 or 12
3.	Steel Piping:	
	3" and Smaller	MSS TYPE Adjustable Band, Type 7

K. Horizontal hanging piping shall be supported as follows:

1.	Copper Pipe:		
	PIPE SIZE	ROD DIA.	MAX. SPACING
	2-1/2" and Larger	1/2"	12'
	1-1/2" to 2"	3/8"	10'
	1" and Smaller	3/8"	8'
2.	PVC Pipe:		
	PIPE SIZE	ROD DIA.	MAX. SPACING
	2-1/2" and Larger	1/2"	10'
	1-1/2" to 2"	3/8"	8'
	1" and Smaller	3/8"	6'
3.	Steel Pipe:		
	PIPE SIZE	ROD DIA.	MAX. SPACING
	2" and smaller	3/8"	10'

2.5 PIPE SLEEVES

- A. Furnish and set sleeves to accommodate pipes passing through foundations, walls, floors, furring and ceilings. Cooperate with other Contractors in setting all sleeves. Sleeves shall be full thickness of construction.
- B. Sleeves shall be large enough to permit free movement of pipe where expansion and contraction occur and to permit insulation to run continuous. Provide U.L. listed fire barrier seals in floor, walls, ceilings, etc., at all penetrations of fire rated construction. Fill annular space between pipe and sleeve with U. L. approved fire retarding packing, rated for 1 hour minimum. See fire stopping details on the drawings.

- C. Sleeves through exterior walls below grade, through foundation walls, shall be watertight construction. Use "Link-seal", compression type neoprene link seals installed in sleeve or core drilled hole.
- D. Sleeves for pipe through exterior masonry wall, floors on grade and through fire partitions shall be of galvanized steel pipe, at least two pipe sizes larger than pipe passing through. Sleeves through interior walls and floors, ceilings, furring and partitions shall be steel pipe. Sleeves for copper piping shall be copper pipe, Type "L", minimum 2 sizes larger or large enough to allow for insulation. Fasten sleeves securely in floors, walls and partitions.
- E. All sleeves in exposed locations shall be set so escutcheon plates specified shall cover entire sleeve.

2.6 ACCESS PANELS

- A. The extent of access requirements of mechanical work is indicated on the mechanical work drawings, or is defined by the provisions of this section and other Division 23 sections, and is hereby recognized to be dependent upon the nature of other adjoining work requiring access. The access units required are recognized to include: (1) those units directly indicated in the Contract Documents, (2) those units indirectly indicated in the Contract Documents by way of mechanical work located behind other construction or finishes, and requiring access, and (3) those additional units identified subsequently to the Contract Date, because of the actual manner in which mechanical work with required access is located in relation to other construction and finishes.
- B. Access panels shall be provided in ceilings, except in removable tile, and in walls to permit access to concealed valves, shock absorbers, trap primers, valves, etc. Valve panels shall be 12" by 12" minimum.
- C. The types of access units required as work of this section include hinged or removable cover plates and access doors, which may include units in walls, ceilings and floor surfaces. (Fire Rated, if required).
- D. Provide access doors manufactured by one of the following, except as otherwise indicated, minimum size 12" x 12":
 - 1. Milcor Div.: Inryco Inc.
 - 2. Jay R. Smith Mfg. Company
 - 3. Zurn Industries, Inc.
- E. IMPORTANT: Because of the extensive use of non-accessible ceilings in this project the location, size and type of access panels will need to be approved and located in compliance with the Architects direction. Submit a coordination plan showing locations, sizes and requirements for access to concealed equipment for review and approval by the design team before proceeding with the rough in and installation of concealed equipment. Final location, and type of access panels to be used shall be reviewed and approved by the design team.
- F. All Access panels shall be key operated, all access panels shall operate with the same key.

2.7 FLOOR, WALL AND CEILING PLATES

- A. Escutcheon plates shall be installed on all exposed pipe passing through walls, floors or ceilings. Plates shall be as manufactured by Ritter Pattern and Casting Co., Bridgeport Brass Co., or an approved equal, chrome-plated steel plates with set screw and concealed hinge. Plastic escutcheons are not approved.

PART 3 - EXECUTION

3.1 PIPING

A. General:

1. All pipes shall be round and straight, of required size. Cutting and threading shall be done with proper tools and pipes shall be reamed to full size after cutting.
2. Pipe sizes shown on the Drawings are nominal pipe sizes and not outside diameters unless specifically noted otherwise. Pipes shall be run substantially as indicated on the Drawings; however, Architect/Engineer reserves the right to require this Contractor to make minor changes in pipe locations where conflicts occur with other trades or existing conditions. Such changes shall be made without extra cost to Owner.
3. All pipes shall be run with proper grade to provide for easy draining and in group runs, where applicable, and in a neat and orderly manner, to the satisfaction of the Architect/Engineer.
4. Piping shall be installed with ample provisions for expansion and contraction to prevent injury to the same and to the building construction. Furnish expansion loops, where indicated or necessary, on long runs and anchors to permit proper loop deflection.
5. In general, unions are not indicated on the Drawings, but shall be provided in the following locations:
 - a. At pipe mounted equipment.
 - b. Connections to all pumps and other equipment requiring isolation for service or repairs.
 - c. Do not conceal unions in wall, partitions or ceilings except where access is available through removable ceiling tiles or access panels.
6. No piping shall be installed so as to cause an unusual noise from the flow therein under normal operation. Grade piping for complete drainage. Provide drain valves at all low points.
7. Ream or file each pipe cut to remove burrs. Inspect each length of pipe and each fitting for workmanship and clear passageway. Caulking of threads will not be allowed on any piping.
8. Keep piping free of dirt, scale. Cover, cap or otherwise protect open ends of all piping during construction to prevent damage to threads or flanges and to prevent entry of foreign matter.
9. All piping through finished areas shall be carried in partitions, chases, or in recesses where provided in walls, through floors and in furred or hung ceilings. Run exposed pipes only where indicated or directed.
10. Where changes in pipe sizing occur, use only reducing eccentric type fittings, top of pipes flat. No bushings will be allowed.
11. No piping shall pass through ductwork, sheet metal work or structural steel unless approved by the Architect or Engineer.
12. Clean exterior surfaces of installed piping systems of superfluous materials, and prepare for application of specific coatings (if any). Flush out piping systems with clean water before proceeding with required tests. Inspect each run of each system for completion of joints, supports and accessory items.
13. Furnish and install 3/4" drain valves as specified, with threaded ends for hose connection to all low points in the mains and where indicated. Grade all supply and circulating piping for complete drainage of the system.

B. Piping System Joints: Provide joints of the type indicated in each piping system as follows:

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 solder flux to joint areas of both tubes and fittings. Insert tube full depth into fitting, and solder in a manner which will draw solder full depth and circumference of joint. Wipe excess solder from joint before it hardens.

3.2 HANGER, SUPPORTS AND ANCHORS

- A. 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.
- B. 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.
- C. 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 supports with maximum spacings complying with MSS SP-69. 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 support piping from other piping.
- D. Provide all necessary inserts, bolts, rods, nuts, washers and other accessories. Except as otherwise indicated for exposed continuous pipe runs, install hangers and supports of same type and style as installed for adjacent similar piping.
- E. Prevent electrolysis in support of copper tubing by use of hangers and supports which are copper plated.
- F. Install hangers and supports to allow controlled movement of hangers and supports which are copper plated.
- G. Load Distribution: Install hangers and supports so that piping live and dead loading and stresses from movement will not be transmitted to connected equipment.
- H. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes.
- I. Insulated Piping: Comply with the following installation requirements:
 - 1. Clamps: Attach clamps, including spacers to piping with clamps projecting through insulation.
 - 2. Shields: Where low-compressive-strength insulation or vapor barriers are indicated install coated protective shields.
- J. Adjust hangers and supports as required under supports to bring piping to proper levels and pitch.

3.3 PIPE SLEEVES INSTALLATION

- A. Install pipe sleeves of the types indicated where piping passes through walls, floors, ceilings, roofs and structural members of the work. Provide sleeves of adequate size, accurately centered on pipe runs.

Size sleeves so that piping and insulation (if any) will have free movement in the sleeve, including allowance for thermal expansion. Where insulation includes a vapor barrier covering, provide sleeve with sufficient clearance for installation of vapor barrier, but not less than 2 pipe sizes larger than piping run. Install length of sleeve equal to thickness of construction penetrated. Provide temporary support of sleeves during placement of concrete and other work around sleeves, and providing temporary closure to prevent concrete and other materials from entering pipe sleeves. Fire stop as detailed to maintain a minimum 2 hour rating.

- B. Provide "Link-seal" units at all pipe sleeves penetrating at exterior walls below grade.
- C. Install escutcheon plates at pipe sleeves where piping is exposed to view in occupied spaces of the building, on the exterior, and elsewhere as indicated.

3.4 VALVES

- A. Install valves where required for proper operation of piping and equipment, including valves in branch lines where necessary to isolate sections of piping. Locate valves so as to be accessible and so that separate support can be provided when necessary.
- B. Install valves with stems pointed up, in the vertical position where possible, but in no case with stems pointed downward from a horizontal plane.
- C. Where insulation is indicated, install valves, arranged in the proper manner to receive insulation, provide handle extensions as specified.

END OF SECTION 22 0510

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 22 0719

PLUMBING SYSTEMS INSULATION

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. Related Work Specified Elsewhere:
 - 1. Refer to all Sections of DIVISION 1 - GENERAL REQUIREMENTS, which are hereby made part of this Section of the Specifications.
 - 2. Excavation and Backfill are specified in Division 31.
 - 3. Concrete Work is specified in Division 3.
 - 4. Flashing of Mechanical Work passing through membrane roof is specified in Division 7.
 - 5. Finish Painting is specified in Division 9.
 - 6. Mechanical Work is specified in Division 23.
 - 7. Electrical Work is specified in Division 26.
- B. Related Documents:
 - 1. The General Provisions of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in this Section.
 - 2. The requirements of Section 22 0500 govern the work specified in this Section, where applicable.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials, and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Domestic Water Piping
 - 2. Air conditioning condensate piping
 - 3. Vent stacks in attic

1.3 QUALITY ASSURANCE

- A. Manufacturers: Provide insulation products produced by one of the following for each type and temperature range of insulation:
 - 1. Armacell
 - 2. Rubatex
 - 3. Owens-Corning
- B. Flame/Smoke Ratings: Provide composite insulation (insulation, jackets, coverings, sealers, mastics and adhesives) with flame-spread rating of 25 or less and a smoke-developed rating of 50 or less, as tested by ASTM E84 (NFPA 255) method.

- C. All Domestic hot and cold water piping shall be installed with vapor barrier insulation materials, installed per the manufacturer's instructions to maintain a continuous vapor barrier. Vapor barrier shall be continuous at all specialties, hangers, valves and fittings. All fittings shall be mitered and sealed with a vapor barrier mastic.
- D. Submit manufacturer's data on insulation indicating certification or other data as necessary to show compliance with these specifications and governing regulations. Include proof of compliance for tests of products for fire rating, corrosiveness, and compressive strength.
- E. Deliver insulation, coverings, cements, adhesives and coatings to the site in factory-fabricated containers with the manufacturer's stamp, or label, affixed showing fire hazard ratings of the products. Store insulation in original wrappings and protect from weather and construction traffic.
- F. All adhesives and sealants shall be Low VOC complying with LEED requirements.

PART 2 -PRODUCTS

2.1 DOMESTIC WATER PIPE INSULATION

- A. All new above hot and cold water domestic water piping be insulated with Manville FLAMESAFE fiberglass pipe insulation, Owens-Corning fiberglass 25, or approved equal as specified below. The insulation shall have an average thermal conductivity not to exceed .25 BTU in. per sq. ft. per F. per hour at a mean temperature of 75 degrees F. Thickness of the insulation shall be as scheduled below. Jacket shall be ASJ. The insulations shall be applied over clean dry pipe with all joints firmly together. Longitudinal jacket laps and the butt strips shall be smoothly secured with self-sealing longitudinal lap joints.
 - 1. Domestic Water Piping:
 - a. Domestic Cold Water Piping: 1/2"
 - b. Domestic Hot Water and Hot Water Recirculation Piping:
 - < 1 1/2" 1"
 - >=1 1/2" 1-1/2"
 - 2. Vent Stacks:
 - a. All Sizes: 1/2"
(for a minimum of 10'-0" below vent through roof penetrations)
 - 3. Condensate Drainage Piping:
 - a. All Sizes: 1/2"
- B. Alternate PEX piping shall be insulated with Armacell "FS Armaflex" closed cell elastomeric foam or approved equal as specified below. The insulation shall have an average thermal conductivity not to exceed .25 BTU in. per sq. ft. per F. per hour at a mean temperature of 75 degrees F. Thickness of the insulation shall be as scheduled below. The insulations shall be applied over clean dry pipe with all joints firmly together. Provide unslit tubular form with no longitudinal joint. Butt strips shall be smoothly secured with sealed with factory adhesive.
- C. All above grade cold water pipe and fittings shall be mitered with continuous vapor barrier mastic sealant. Valves shall have handle extensions insulated with closed cell neoprene tape wrap sealed with

vapor barrier mastic and installed to prevent sweating. All strainers, drain valves and specialties to be insulated and sealed to prevent sweating. All insulation systems to run continuous through hangers and shall be installed with continuous vapor barrier.

- D. Air conditioning condensate drain piping shall be insulated with Armacell "FS Armaflex" closed cell elastomeric foam or approved equal as specified below. The insulation shall have an average thermal conductivity not to exceed .25 BTU in. per sq. ft. per F. per hour at a mean temperature of 75 degrees F. Pipe insulation shall be ½" Thickness. The insulations shall be applied over clean dry pipe with all joints firmly together. Provide un-slit tubular form with no longitudinal joint. Butt strips shall be smoothly secured with sealed with factory adhesive.
- E. All seams and joints in the insulation system at fittings, valves, etc. shall be wrapped with insulated tape and sealed for continuous vapor barrier.

PART 3 -EXECUTION

3.1 INSULATION

- A. Insulation shall not be omitted on piping behind walls or in ceiling spaces. Covering shall be applied before finish work proceeds. Longitudinal seams on jackets shall be located so that they are not visible from the floor. Remove all stickers from covering. Insulation shall be applied over clean pipe with all joints butted firmly together and sealed with butt strips.
- B. Insulation shall run through all hangers and sleeves and have an 18 gauge sheet metal saddle equal to three (3) times the pipe diameter in length. All pipes 3" and larger in diameter shall be supported through insulation by fitting a protection saddle to the thickness of the insulation. Protection saddle shall be equal to Grinnell Co. Figure 160 to Figure 165A insulation shield protection saddles.
- C. All fittings, valves, etc. shall be insulated with the proper factory precut insulation. The ends of the insulation shall be tucked into the throat of the fitting and the edge adjacent to the pipe covering tufted and tucked into fully insulated pipe fitting. The one-piece PVC fitting cover shall then be secured by taping the ends to the adjacent pipe covering.
- D. Covering shall not be applied until all parts of the work have been tested by Contractor and approved by the Architect/Engineer.
- E. Where vapor barrier is called for, it shall be applied in accordance with the manufacturer's instructions to maintain the integrity of the vapor barrier.
- F. On exposed insulation, all longitudinal seams shall be kept at the top of the pipe and circumferential joints shall be kept to a minimum. Raw ends of insulation shall be concealed by neatly folding in the ends of the jackets. Fittings, valve bodies, and flanges shall be furnished with the same jacket materials used on adjoining insulation.

END OF SECTION 22 0719

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 22 1116

DOMESTIC WATER SYSTEMS

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. Related Work Specified Elsewhere:

1. Refer to all Sections of DIVISION 1 - GENERAL REQUIREMENTS, which are hereby made part of this Section of the Specifications.
2. Excavation and Backfill are specified in Division 31.
3. Concrete Work is specified in Division 3.
4. Flashing of Mechanical Work passing through membrane roof is specified in Division 7.
5. Finish Painting is specified in Division 9.
6. Mechanical Work is specified in Division 23.
7. Electrical Work is specified in Division 26.

B. Related Documents:

1. The General Provisions of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in this Section.
2. The requirements of Section 22 0500 govern the work specified in this Section, where applicable.

1.2 DESCRIPTION OF WORK

A. Work Included: Provide labor, materials, and equipment necessary to complete the work of this Section, including but not limited to the following:

1. Domestic cold water system connecting each and every fixture, device, and item of equipment requiring cold water within the buildings, as well as all connections to existing or new water service mains as indicated on Contract Drawings. The system shall be installed with all incidentals necessary for a complete operational system and shall include all piping, valves, stops, hydrants, meters, backflow preventers, gauges, structural support (hangers), and such other standard or specified accessories as are necessary for a complete approved system.
2. Domestic hot water system connecting each and every fixture, device, and item of equipment requiring hot water within the building. The system shall be installed with all incidentals necessary for a complete operational system including, but not limited to water heater, pumps, controls, all piping, valves, stops, backflow preventers, vacuum breakers, structural support (hangers, etc.), and such other standard or specified accessories as are necessary for a complete approved system.
3. Domestic water heaters and specialties as detailed.
4. Insulation of domestic water piping as specified in Section 22 0719.

5. All Labor, Materials and Equipment for all alterations, additions, removal and/or relocation of all existing equipment, material and/or services as required for new construction.
6. Domestic water heater thermostatic mixing valves and controls.

1.3 CODES AND STANDARDS

- A. Domestic water systems shall comply with applicable National, State and Local Codes and Regulations.

1.4 STERILIZATION

- A. After completion all new domestic water piping and renovations to existing systems the systems shall be disinfected in accordance with the following:
 1. Piping systems shall be filled with water solution containing 50 PPM of available chlorine and allowed to stand for a minimum of six (6) hours.
 2. Following the allowed standing time the system shall be drained and flushed with clean potable water until no chlorine remains in the water coming from the systems.
 3. After the systems have been flushed, drained and refilled, samples of the water will be taken to the State Health Department for a test. If it has been found that all impurities have not been removed, the above shall be repeated until the system is free from all impurities.

1.5 INSULATION

- A. Insulation of domestic cold and hot water system piping is specified in Section 22 0719, "Plumbing Systems Insulation".

1.6 CROSS CONNECTIONS

- A. No pipe shall be installed which will provide a cross or interconnection between the water systems and a polluted supply or drainage system. All submerged water connections with hose threaded outlets shall be protected by a suitable air gap, approved type backflow preventer or vacuum breaker.

1.7 SUBMITTALS

- A. Submit manufacturer's data on all water valves, specialties and equipment including rough-in drawings, templates, instructions, and directions for connection with water piping and plumbing fixtures and equipment.
- B. Submit shop drawings on the following products:
 1. All piping, valves and valve accessories.
 2. Gauges, thermometers, strainers and all water specialties.
 3. Domestic water heaters.
 4. Thermostatic mixing valve assembly.
 5. Pressure reducing valves.
 6. Backflow preventers and service equipment.
 7. Non-freeze wall hydrants.

8. Access Panels.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

- A. Refer to Section 22 0510 for piping, fittings, solder and associated piping accessories. All exposed domestic hot and cold water runs to plumbing fixtures and sinks shall be chrome plated.
- B. Unions
 - 1. Refer to Section 22 0510 for unions.
 - 2. Provide di-electric unions where cooper tube is connected to ferrous pipe, refer to Section 220510.

2.2 VALVES

- A. Refer to Section 22 0510 for all valves.
- B. Refer to Section 22 0510 for drain valves.

2.3 HANGERS

- A. Refer to Section 22 0510 for hangers and supporting devices.
- B. Perforated strap iron hanger or Milford type copper plated steel hangers are not acceptable.

2.4 ACCESS PANELS

- A. Refer to Section 22 0510 for access panels.
- B. Provide access panel doors for all concealed inaccessible valves, balancing fittings, in walls or ceilings shall be furnished by this Contractor and installed by tradesmen of wall or ceiling finish. Provide fire rated access panels when installed in rated assemblies, refer to Architectural Drawings for locations of fire rated assemblies.

2.5 WATER PIPING SPECIALTIES

- A. Provide the following piping specialties for installation in the water piping systems at the locations shown or as required by the project installation requirements.
 - 1. Pressure Gauges: Furnish and install pressure gauges as specified in Section 22 0510, "Plumbing Basic Materials and Methods".
 - 2. Thermometers: Refer to Section 22 0510, "Plumbing Basic Materials and Methods".
 - 3. Thermostatic mixing valve: As specified on the drawings.
 - 4. Boiler make-up water pressure reducing valve: As specified on drawings.

5. Boiler make-up water backflow preventer: As specified on drawings.
6. Trap Primers: Models as specified on the drawings.
7. Non-Freeze Wall Hydrants: Wall hydrant shall be Woodford Model B67, or an approved equal, with recessed box and loose key operated door, automatic draining with double check backflow preventer. ASSE Standard 1052 approved. 3/4" inlet and outlet. Hardened stainless steel operating stem and one-piece valve plunger to control both flow and drain functions. Exterior finish to be Chrome Plated, provide loose tee key with each hydrant.

2.6 DOMESTIC WATER HEATERS

- A. Furnish and install domestic hot water heaters as scheduled on the drawings.
- B. Provide thermostatic mixing valve, thermostatic expansion tank, pressure and temperature relief valve and other valve and specialties as detailed.

PART 3 - EXECUTION

3.1 INSTALLATION/APPLICATION/ERECTION/PIPING

- A. The arrangement of all piping indicated on the Drawings is generally diagrammatic. Conditions at the building shall determine the actual arrangement of runs, bends, offsets, etc.; conditions at the building shall be the determining factor for all measurements. The layout of all work shall be subject to the approval of the Architect/Engineer, but the Contractor shall be responsible for the necessary coordination of the work under this Contract. Wherever practicable, as determined by the Architect/Engineer, piping shall be installed concealed.
- B. Pipes passing through floors, concrete or masonry walls shall be centered in sleeves of pipe set in the concrete before pouring or grouted in masonry walls. Sleeves in the floor slab shall extend 2" above the finished floor. Sleeves shall be of the first possible pipe size larger than the pipe or insulated pipe overall diameter to yield a clearance of not less than 1/2" between the sleeve and the pipe or insulation. All insulated piping must be insulated continuously through pipe sleeves.
- C. All exposed piping to all fixtures, sinks and items of equipment shall be chrome plated. All connections to branches and fixtures shall be taken from top of mains.

3.2 VALVES

- A. Drains shall be installed at all low points of the water distribution systems. Stop valves shall be installed at each fixture and hydrant. Valves shall be so placed as to be readily accessible and shall not be installed with the stem inclined at more than 90 degrees from the upright position. The stuffing boxes of all valves shall be packed with new wicking and drips eliminated. All exposed piping must be chrome plated.

3.3 ADJUSTMENTS

- A. Adjust all pressure reducing valves, hot water tanks and fixture supply fittings for proper operation, and water temperature controllers for proper outlet temperatures.

3.4 TESTS

- A. Tests for Plumbing Systems: Water piping shall be tested by this Contractor and approved before acceptance. Equipment required for tests shall be furnished by the Contractor at no additional cost to the Owner. All tests shall be witnessed and approved by the Plumbing Inspector or his representative.
- B. Water System: When the roughing-in is complete, and before fixtures are set, the entire hot and cold water piping system shall be tested per Section 22 0500, "Basic Materials and Methods". Where a portion of the water piping system is to be concealed before completion, this portion shall be tested separately as specified for the entire system.
- C. Defective Work: If inspection or test indicate defects such defective work or material shall be replaced or repaired as necessary and inspection and tests repeated.

END OF SECTION 22 1116

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 22 4210

PLUMBING WORK

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. Related Work Specified Elsewhere:

1. Refer to all Sections of DIVISION 1 - GENERAL REQUIREMENTS, which are hereby made part of this Section of the Specifications.
2. Excavation and Backfill are specified in Division 31.
3. Concrete Work is specified in Division 3.
4. Flashing of Mechanical Work passing through membrane roof is specified in Division 7.
5. Finish Painting is specified in Division 9.
6. Mechanical Work is specified in Division 23.
7. Electrical Work is specified in Division 26.

B. Related Documents:

1. The General Provisions of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in this Section.
2. The requirements of Section 22 0500 govern the work specified in this Section, where applicable.

1.2 DESCRIPTION OF WORK

A. Work Included: Provide labor, materials, and equipment necessary to complete the work of this Section, including but not limited to the following:

1. New Sanitary, waste, and vent systems within the buildings, as shown on the drawings, installed with all incidentals necessary for a complete operational system. The system shall include all fixtures, piping, traps, flanges, seals, cleanouts, structural supports, roof terminals, fixtures, floor drains, floor receptors, indirect waste drains and such other standard accessories as are necessary for a complete approved system.
2. All final connections to all items of equipment furnished by others requiring drain, waste and water services connections.

1.3 CODES AND STANDARDS

A. ANSI Standards: Comply with applicable ANSI Standards pertaining to plumbing fixtures and systems.

- B. ANSI Standards: Comply with ANSI A117.1 standard and latest edition of the American Disabilities Act (ADA) pertaining to installation of plumbing fixtures and trim for the disabled.
- C. Codes: Comply with latest adopted edition of the 2018 International Plumbing Code incorporating all local codes and regulations.

1.4 SUBMITTALS

- A. Submit manufacturer's data on plumbing fixtures and equipment including rough-in drawings, templates, instructions and directions for connections with water, waste, soil, and anchorages for plumbing fixtures.
- B. Submit shop drawings on the following products:
 - 1. Sanitary waste and vent piping and fittings.
 - 2. Rain Leader piping and fittings.
 - 3. Floor drains.
 - 4. Wall, floor and line cleanouts, including covers and access panels
 - 5. Plumbing fixtures and trim.

1.5 TESTS

- A. Hydrostatic tests of all soil, waste and vent Piping shall be performed in accordance with the Governing Regulations and in accordance with Section 22 0500, Basic Materials and Methods.

1.6 PLUMBING CROSS CONNECTIONS

- A. No pipe shall be installed which will provide a cross or interconnection between the water systems and a polluted supply or drainage system. All submerged water connections with hose threaded outlets shall be protected by a suitable air gap, approved type backflow preventer or vacuum breaker.

PART 2 - PRODUCTS

2.1 PLUMBING PIPING MATERIALS AND VALVES

- A. All soil, waste, and vent piping shall be as specified in Section 220510, "Plumbing Basic Materials and Methods".
- B. Minimum vent terminal through roof shall be 4". Vent flashing at the roof shall be by the Roofing Contractor. Terminations shall be limited to 12" above finished roof to avoid frost closure.
- C. Unions:
 - 1. Unions shall be as specified in Section 220510, "Plumbing Basic Materials and Methods".

2. To prevent corrosion caused by dissimilar metals, this Contractor shall install dielectric unions or flanges where copper pipe or tubing is connected to ferrous pipe as specified in Section 220510, "Plumbing Basic Materials and Methods".

2.2 HANGERS

- A. Provide hangers as specified in Section 220510, "Plumbing Basic Materials and Methods".
- B. Hangers or supports shall be placed within 1' of each horizontal elbow. Vertical runs of pipe not over 5' in length shall be supported on hangers placed not over 12" from the elbow on the connecting horizontal run.
- C. Perforated strap iron hanger or Milford type copper plated steel hangers are not acceptable.
- D. Support pipes sufficiently clear of all part of structure to allow for full thickness of insulation.

2.3 TRAPS

- A. Traps at fixtures shall be as listed in the fixture schedule. Exposed traps shall be chrome plated and provided with bottom cleanout plug.
- B. Provide deep seal traps for all floor drains and floor receptors.

2.4 CLEANOUTS AND ACCESS PANELS

- A. Floor cleanouts shall be Zurn 1400 Series Level-trol, or an approved equal, Supreme cleanouts with polished bronze top. Cleanouts shall be set flush and level with top of finished floor surface.
- B. Wall cleanouts shall be brass, recessed head plugs with Zurn ZN-1443 access frame and cover.
- C. Access panel doors for all concealed inaccessible cleanouts in walls, or ceilings shall be furnished by this Contractor and installed by tradesmen of wall or ceiling finish. Access panels shall be type as specified in Section 220510, "Plumbing Basic Materials and Methods".

2.5 DRAINS

- A. Floor Drains: See Plumbing Fixture Schedules for specifications.
- B. All floor drains shall be tested to verify proper drainage at final completion.

2.6 PLUMBING FIXTURES

- A. General Requirements: References made herein to outfit numbers and figure numbers of plumbing fixtures are based on American Standard plate numbers to establish type and quality of materials. Angle stops, straight stops, stops integral with the faucets, or concealed type of lock shield, wheel handle stops for supplies shall be furnished and installed with fixtures as specified below. Exposed traps and supply pipes for all fixtures and equipment shall be chrome plated and connected to the

rough piping systems at the wall. Wall escutcheons shall be chromium plated or nickel plated brass with polished, bright surfaces. Fixtures shall be American Standard, Kohler Company and Eljer or approved equal.

- B. The Plumbing Contractor shall furnish all supports, brackets, bolts, etc. for proper installation of all fixtures requiring support. They shall be in accordance with the manufacturer's recommendations, and, if necessary, shall be built into place as the building progresses. This Contractor shall be held responsible for the stability and proper support of all plumbing fixtures.
- C. All fixtures and fittings shall be made tamperproof. The use of screwdriver type adjustments is not acceptable, unless slots are capped or otherwise protected.
- D. See Plumbing Fixture Schedules on Sheet P6.
- E. All applicable Plumbing Fixtures shall be Watersense certified.

PART 3 - EXECUTION

3.1 INSTALLATION/APPLICATION/ERECTION/PIPING

- A. The arrangement of all piping indicated on the Drawings is generally diagrammatic. Conditions at the building shall determine the actual arrangement of runs, bends, offsets, etc.; conditions at the building shall be the determining factor for all measurements. The layout of all work shall be subject to the approval of the Architect/Engineer, but this Contractor shall be responsible for the necessary coordination of the work under this Contract. Wherever practicable, as determined by the Architect/Engineer, piping shall be installed concealed.
- B. Pipes passing through floors, concrete or masonry walls shall be centered in sleeves of pipe set in the concrete before pouring or grouted in masonry walls. Sleeves in the floor slab shall extend 2" above the finished floor. Sleeves shall be of the first possible pipe size larger than the pipe or insulated pipe overall diameter to yield a clearance of not less than 1/2" between the sleeve and the pipe of insulation.
- C. Soil, vent, drainage and waste lines shall be carefully graded, fitted and joined together. Joints shall be made gas and water tight. Horizontal drainage piping shall be installed in practical alignment within the building at a uniform grade of not less than 1/8" fall per foot and not more than 3/4" fall per foot. Pipe to be installed without undue strain or stresses and provisions made for expansion, contraction and structural settlement. Every fixture, floor drain and item of equipment shall be individually trapped and vented. Any soil and waste lines shall be provided with cleanouts at every change in direction and at the foot of vertical stacks. Changes in direction shall be made with Y's or 45 degree elbows. All offsets in vertical lines shall be made at a minimum angle of 45 degrees.

3.2 FIXTURES

- A. Fixtures shall be the best product of the manufacturer and shall be without defects in construction or appearance and shall be set true and level, firmly supported in place without rocking or strain. Fixtures shall be adjusted for proper operation and shall be tested in the presence of the

Architect/Engineer. All fixtures shall be thoroughly cleaned and all labels, stickers, and dirt marks shall be removed.

- B. The installation of all backing for plumbing fixtures and their accessories not affecting the structure shall be the work of this Contractor. Cutting and chasing which does not affect the structure shall also be the work of this Contractor.

3.3 TESTS

- A. Tests for Plumbing Systems: Soil, waste and vent piping shall be tested by the Contractor and approved before acceptance. Underground soil and waste piping shall be tested prior to backfilling. Equipment required for tests shall be furnished by this Contractor at no additional cost to the Owner. All tests shall be witnessed and approved by the Engineer and/or the Plumbing Inspector.
- B. Drainage and Venting System Piping: Shall be tested with water or air before the fixtures are installed in accordance with Section 22 0510 – Plumbing Basic Materials and Methods.

END OF SECTION 22 4210

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 23 0500

MECHANICAL GENERAL REQUIREMENTS

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. Related Work Specified Elsewhere:

1. Refer to all Sections of DIVISION 1 - GENERAL REQUIREMENTS, which are hereby made part of this Section of the Specifications.
2. Excavation and Backfill are specified in Division 31.
3. Concrete Work is specified in Division 3.
4. Flashing of Mechanical Work passing through membrane roof is specified in Division 7.
5. Finish Painting is specified in Division 9.
6. Plumbing Work is specified in Division 22.
7. Electrical Work is specified in Division 26.

B. Related Documents:

1. The General Provisions of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in this Section.
2. The requirements of Section 22 0500 govern the work specified in this Section, where applicable.

C. Reference to Drawings: All work to be performed is shown on Drawings listed at the end of this Section:

1. This Contractor shall refer to the Drawings for a full comprehension of the work to be done and for conditions affecting the location and placement of equipment and materials. These Drawings are intended to be supplementary to the specifications and any work indicated, mentioned, or implied in either is to be considered as specified by both. Should the character of the work herein contemplated or any matter pertaining thereto be not sufficiently explained in the specifications or drawings, this Contractor may apply to the Architect/ Engineer for further information and shall conform to such when given, as it may be consistent with the original intent. The Architect/Engineer reserves the right to make any reasonable changes in location prior to installation at no expense to the Owner. All lines are diagrammatic and exact locations are subject to the approval of the Architect/Engineer.
2. Before submitting his Bid, this Contractor shall visit the site with the plans and specifications and shall become thoroughly familiar with all conditions affecting his work since the Contractor will be held responsible for any assumptions they may make in regard thereto.
3. This Contractor shall, at all times, have a foreman or superintendent on the project authorized to make decisions and receive instructions as if the Contractor himself were present. The foreman or superintendent shall not be removed or replaced without the express approval of the Architect/Engineer after construction work begins.
4. This Contractor shall employ competent and experienced workmen at a regular schedule in harmony with the other tradesmen on the job. The Contractor shall also exercise care and supervision of his employees in regard to proper and expeditious layout of his work.

- D. Extent: This specification applies to the renovations and additions at the Whitefield Library in Whitefield, New Hampshire. The Mechanical work required without limiting the generality thereof, includes the furnishing of all labor, materials, equipment, and services necessary for and reasonably incidental to the complete installation of all piping, radiation, gas fired boilers, chimney systems, heat recovery units, cooling coils, heating coils, fan coil units, air distribution ductwork, pool dehumidification unit, ductwork, chiller, economizer cooler, pumps, kitchen gas fired make-up air unit, kitchen hood make-up and exhaust ducting, kitchen exhaust ductwork, refrigerant piping, heating and chilled water piping and accessories, insulation of ductwork and piping, automatic temperature control system, installation of equipment, controls and accessories furnished by the owner or other suppliers including final connections, and all other materials, equipment, and labor necessary, whether or not such items are specifically indicated on the drawings or in the specifications, to complete all mechanical systems in all respects ready for continuous and trouble free operation.
- E. Intent: It is the intent of the Contract Documents to include all work and materials necessary for erecting complete, ready for continuous use all mechanical systems as shown on the accompanying drawings or as hereinafter described. These Drawings shall be taken in a sense as diagrammatic; sizes of pipes, ducts, etc., and methods of running them are shown, but it is not intended to show every offset and fitting nor every structural difficulty that will be encountered during the installation of the work.

1.2 SUBMITTALS

- A. Refer to General Conditions for submittal provisions and procedures. Approval by the Architect/Engineer must be obtained prior to delivery of materials to the site.
- B. Shop Drawings: Within thirty (30) days of award of contract, the Mechanical Contractor shall submit, for approval, one electronic copy of a complete list of manufacturer's shop drawings, detail prints, and data sheets for all shop drawings required.
- C. Product Data: Submit one electronic copy of the manufacturer's specifications and installation instructions for each class of material or equipment and include other data as may be required to show compliance with these specifications.
- D. Test Reports: Submit certified test laboratory reports as necessary to show compliance with requirements.
- E. Colors: Colors of all materials shall be as selected by the Architect/ Engineer from the standard color ranges of each manufacturer from samples submitted as per above.

1.3 QUALITY ASSURANCE

- A. Equality of Materials: Equality of materials or articles other than those named or described in this Section will be determined in accordance with the CONDITIONS OF THE CONTRACT.
- B. Tests: This Contractor agrees to accept as final the results of tests secured by a qualified testing laboratory engaged by the Owner. Tests will be conducted in accordance with the CONDITIONS OF THE CONTRACT.
- C. Products:

1. All materials shall be new, full weight and first class in every respect, without defects, and designed to function properly in that portion of the work for which they are intended and with the same brand of manufacturers for each class of material or equipment.
2. Equality of material or equipment other than those named or described in this Section will be determined in accordance with the revisions of the Contract and as specified further herein.

1.4 REFERENCE STANDARDS

- A. The work shall be performed in such a manner as to conform to the Codes and Regulations governing such work, as may be required by Local and State Ordinances. This Contractor and his Subcontractors shall inform themselves of all State and Federal work safety rules and regulations, including the latest provisions of the Occupational Safety and Health Act of 1971 and all subsequent provisions. All workmen employed on the project shall be instructed in the requirements and shall observe same at all times.
- B. All work installed under these Plans and Specifications must be installed in strict accordance with the requirements of all local, state and other departments having jurisdiction, the utility companies, and with the requirements of the Underwriters' Laboratories, State Building Code, Fire Protection Regulations, N.F.P.A., Factory Mutual, and/or similar codes applied thereto. Where provisions of the Contract Documents conflict with any codes, or rules and regulations, the latter shall govern. Where the contract requirements are in excess of applicable codes, rules and regulations, the Contract provisions shall govern.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: This Contractor shall provide for the delivery of all his materials and fixtures to the building site when required so as to carry on his work efficiently and to avoid delaying his work and that of other trades.
- B. Storage and Handling: This Contractor shall, at all times, fully protect his work and materials from injury or loss by others. Any injury or loss which may occur shall be made good without expense to the Owner. The Contractor shall be responsible for the proper protection of all his materials until the building is accepted by the Owner.

1.6 PERMITS AND CODES

- A. This Contractor shall obtain and pay for all licenses and permits and shall pay for all fees and charges for the connection to outside services and use of property other than the site of the work for storage of materials or other purposes.
- B. Work under this Contract shall be installed to comply strictly with latest applicable editions of International Building Code, including Supplements thereto and local amendments if any, current State Energy Efficient Commercial Construction, Underwriters' Laboratories Regulations, National Fire Protection Association, ASHRAE Guide, SMACNA, ASME Code for Boiler and Unfired Pressure Vessels, Pipe, Fittings, Threads, Valves and Supporting Devices, National Electric Code and all codes, regulations, and requirements of all Municipal, State, Federal and other public or private authorities which have jurisdiction. In each case, codes, regulations and standards are minimum requirements and where the contract documents exceed these minimum conditions, the contractor shall comply with the more stringent requirements.

1.7 MATERIALS AND SUBSTITUTIONS

- A. All materials shall be new and conform to standards established in plans and specifications.
- B. Equipment, materials or items of other manufacturers, of equivalent design, quality and capacity, will be considered as substitutes to those specified or noted on the Drawings. Engineer reserves the right to reject any substitute offered for items specified or noted on Drawings.
- C. Substitute material and equipment, where requested or proposed by Contractor, shall be itemized and shall show cost to Owner whether it be an "addition" or "deduction" or "no change in cost" to the Base Bid price. It shall be held that no change in contract completion time will occur should Engineer elect to accept any alternate unless such time is specifically stated in the Contractor's Bid.
- D. Materials and equipment not approved shall not be used in construction.

1.8 WORKMANSHIP

- A. All work shall be executed in a workmanlike manner, presenting a neat, mechanical appearance when completed. Work not approved by Architect or Engineer shall be replaced by Contractor without additional charge to Owner. Align, level and adjust for satisfactory operation, install so that connecting and disconnecting of piping and accessories for inspection, operation, maintenance and repair. Minor deviations from indicated arrangements may be made as approved.
- B. Piping and ductwork shall be run as straight and direct as possible, forming right angles or parallel lines with building walls and other pipes, neatly spaced. Check with other trades and prevent interference.
- C. Piping and ductwork shall be cut and fabricated accurately according to measurements taken at the building.
- D. This Contractor shall perform his work so as to cause no delay or interference with the progress of the general construction of the building and the work of the other trades or subcontractors. Materials and equipment shall be installed as soon as conditions or construction permit. Confer with all other trades or Subcontractors as to location of pipes, ducts, conduit and apparatus to avoid interference during installation.

1.9 CLEANING AND ADJUSTMENT

- A. Each Contractor shall clear away all debris, surplus materials, etc., resulting from his work or operation, leaving the job and equipment furnished in a clean, first-class condition.
- B. Cleaning, Flushing and Inspecting: Clean, flush and inspect each piping system in accordance with requirements of Section 23 0501, HVAC Basic Materials and Methods Section.
- C. Clean ductwork internally, unit-by-unit as it is installed of dust and debris. Clean external surfaces of foreign substances which might cause corrosive deterioration of metal or, where ductwork is to be insulated or painted, might interfere with or cause deterioration to final finish.
- D. Painting of materials and equipment furnished under the mechanical portion of the Contract will be done under the General Construction Contract. The Contractors shall, however, refinish and restore to the original condition and appearance, all equipment which has sustained damage to the

manufacturer's enamel or paint finish. Materials and workmanship shall be equal to the requirements of the General Construction Contract.

1.10 CERTIFICATES, DOCUMENTS AND INSTRUCTIONS

- A. Certificates and documents listed below for the convenience of Owner and Contractors are required under Mechanical and Electrical Section of the specifications. Previous to final payment, Contractor shall deliver copies of all such certificates and documents to the Architect for approval:
1. All test data specified to be submitted under "TEST".
 2. Operating and Maintenance instructions for mechanical and electrical equipment and systems.
 3. All approved shop drawings.
 4. Temperature Control shop drawings with complete points list, logic diagrams and programming manuals.

1.11 MISCELLANEOUS STEEL SUPPORTS

- A. See drawings and schedules for equipment and materials that need to be fastened to and/or supported by the structure. Furnish and install all necessary anchor bolts, inserts, steel beams, bars, bearing and leveling plates and incidental items as may be needed to install the work. Items to be built into masonry and concrete must be furnished to the respective trade at the proper time to be built-in and shall include instructions and templates for their installation, unless it is explicitly shown or specified otherwise.

1.12 REFERENCE STANDARDS AND INDUSTRY SPECIFICATIONS

- A. Any material or operation specified by reference to published specifications of a manufacturer, a society, an association, a code or other published standard, shall comply with requirements of the listed document which is current on date of receipt of Bids. In case of a conflict between referenced documents, the one having more stringent requirements shall govern. Any Contractor, when requested, shall furnish a sworn affidavit from the manufacturer certifying that materials and/or manufactured products delivered to the job meet the requirements specified. However, such affidavit shall not relieve the Contractor from responsibility of complying with any added requirements of the project specifications.
1. International Building Code (IBC)
 2. American Society of Mechanical Engineers (ASME)
 3. Underwriters Laboratories (U.L.)
 4. American National Standards Institute, Inc. (ANSI)
 5. National Electrical Manufacturers Association (NEMA)
 6. American Society of Testing Materials (ASTM)
 7. National Electrical Code (NEC)
 8. Air Moving and Conditioning Associations (AMCA)
 9. Associated Air Balance Council (AABC)
 10. National Fire Protection Association (NFPA)
 11. International Energy Conservation Code (IECC)

1.13 WARRANTY

- A. The Contractor shall and hereby does warrant that all work executed and all HVAC equipment shall be free from defects of workmanship and materials for a period of one year from date of Substantial Completion of this work. The Contractor further agrees that he will, at his own expense, repair and replace all such defective work and all other work damaged thereby which becomes defective during the term of the Guarantee/Warranty.
- B. Use of Mechanical systems shall not constitute final acceptance and shall not constitute the start of the specified guarantee period.

1.14 RECORD DRAWINGS

- A. Refer to General Conditions for Record Drawings.
- B. Record Drawings shall reflect all changes from the Contract Drawings whether by change order or by field conditions. Principal dimensions of concealed work, fire dampers , volume dampers, control dampers and control valves, and for piping installation including all major risers, valves, shut-offs and drains. Valve numbers shall be added as soon as established.

1.15 OPERATION AND MAINTENANCE MANUALS

- A. After all final tests and adjustments have been completed, fully instruct the proper Owner's representative in all details of operation for equipment installed. Supply qualified personnel to operate equipment for a minimum of 16 hours to assure that Owner's representative is properly qualified to take over operation and maintenance procedures. Also refer to Division 1 for related and additional information regarding project training requirements and Section 230900 for control systems training requirements.
- B. Furnish the Architect/Engineer, for their approval, one electronic copy of an Operation and Maintenance Manual. Inscribe the following identification on the cover: the words OPERATION AND MAINTENANCE MANUAL, the name and location of the equipment or the building, the name of the Contractor, and the Contract number. The manual shall have a table of contents with tab sheets placed before each section. The instructions shall be legible and easily read, with large sheets of drawings folded in. The manuals shall be bound in hard binders or an approved equivalent.
- C. The manual shall include, at a minimum, the following information:
 - 1. Description of systems.
 - 2. Description of start-up, operation, and shutdown procedures for each item of equipment.
 - 3. Winter/summer changeover procedures.
 - 4. Schedule of adjustment, care, and routine maintenance for each item of equipment.
 - 5. Lubrication chart.
 - 6. Wiring and control diagrams with data to explain detailed operation and control of each item of equipment.
 - 7. Valve chart.
 - 8. List of recommended spare parts.
 - 9. Copies of all service contracts.
 - 10. Performance curves for pumps, fans, etc.

11. List of all names, addresses, and phone numbers of all Subcontractors as well as the local representative for each item of equipment.
12. Copies of all approved Shop Drawings.
13. Copies of all Test Reports.
14. All warranties for materials and equipment.
15. All certificates of approval from applicable agencies for systems installed on this project.
16. Final air and water flow balance report for all systems.
17. Complete Equipment start-up reports prepared by factory authorized technicians.
18. List of stock items and spare parts.

- D. See "Automatic Temperature Control", Section 23 0900 for additional requirements.

1.16 PROTECTION

- A. Work shall include protecting the work and material of all other trades from damage by work or workmen, and shall include making good all damage thus caused.
- B. The Contractor shall be responsible for work and equipment until finally inspected, tested, and accepted; protect work against theft, injury, or damage; and carefully store material and equipment received on site which is not immediately installed. Close open ends of work with temporary covers or plugs during construction to prevent entry of obstructing or foreign material.
- C. Work includes receiving, unloading, un-crating, storing, protecting, setting in place, and connecting-up completely any equipment supplied. Work shall also include exercising special care in handling and protecting equipment and fixtures, and shall include the cost of replacing any of the equipment and fixtures which are missing or damaged by reason of mishandling or failure to protect on the part of the Mechanical Contractor.
- D. Equipment and material stored on the job site shall be protected from the weather, vehicles, dirt, and/or damage by workmen or machinery. Ensure that all electrical or absorbent equipment or material is protected from moisture during storage.

1.17 IDENTIFICATION OF EQUIPMENT AND PIPING SYSTEMS

- A. All equipment shall be identified with a 3" wide by 1" high black phenolic nameplate with 1/2" high white letters. Nomenclature shall be required to accurately identify its respective equipment. Nameplates shall be secured to the equipment with suitable screws.
- B. All piping systems shall be identified with direction of flow arrows and printed color coded bands of plastic tape applied after finish painting of insulation and bare pipe. Letters to be not less than 1" high. Note color and working on valve tag chart. Pipe labels to be Seton Name Plate Corporation, Style B wrap around vinyl tape or other approved equal completely wrapped around the pipe and adhered to itself. Tape and label background colors shall conform to ASA recommendations.
- C. Piping shall be labeled as follows:
1. Label all exposed piping which is not in the same room with major equipment at least once in each room through which the pipes pass, but never more than 15' between labels.
 2. Label all piping adjacent to major equipment and include zone or equipment numbers when there are two or more pieces of similar equipment.

3. Direction of flow arrows shall be applied to piping adjacent to all labels and at each piece of equipment.

1.18 REMOVALS

- A. Existing Mechanical work as shown on the demolition drawings shall be removed, recycled and/or legally disposed of. The contractor shall be responsible to field verify extent of removals prior to bidding.
- B. Obtain a list of any items which the Owner will salvage and deliver all such items to on-site location directed by the Owner.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 23 0500

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 23 0510

MECHANICAL BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. Related Work Specified Elsewhere:
 - 1. Refer to all Sections of DIVISION 1 - GENERAL REQUIREMENTS, which are hereby made part of this Section of the Specifications.
 - 2. Excavation and Backfill are specified in Division 31.
 - 3. Concrete Work is specified in Division 3.
 - 4. Flashing of Mechanical Work passing through membrane roof is specified in Division 7.
 - 5. Finish Painting is specified in Division 9.
 - 6. Plumbing Work is specified in Division 22.
 - 7. Electrical Work is specified in Division 26.
- B. Related Documents:
 - 1. The General Provisions of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in this Section.
 - 2. The requirements of Section 23 0500 govern the work specified in this Section, where applicable.

1.2 GENERAL PROVISIONS

- A. Unless otherwise indicated, the materials to be furnished under this Contract shall be the standard products of manufacturers regularly engaged in the production of such equipment and shall be the manufacturer's latest standard design that complies with the Specification Requirements.
- B. Each major item of equipment shall have the manufacturer's name, address, serial and model numbers on a plate securely attached to the item. Each length of pipe fitting and device shall be labeled with the maker's name or symbol and weight or class of product.
- C. Belts, pulleys, chains, gears, couplings, projecting set-screws, keys and other rotating parts shall be located so that any person can come in close proximity and will be fully protected or properly guarded. High temperature equipment and piping so located as to endanger personnel or create a fire hazard shall be properly guarded or covered with insulation of a type specified in Section 23 0719 HVAC Insulation.
- D. The Contractor shall obtain detailed information from the manufacturers of apparatus which he is to provide for the proper methods installation. He shall also obtain all information from the General Contractor and other subcontractors which may be necessary to facilitate his work and the completion

of the whole project. The Contractor shall coordinate his work with the General Contractor. All work shall be installed in a manner and in locations approved by the Engineer.

- E. The Contractor shall keep himself fully informed as to the shape; size and position of all openings and foundations required for his apparatus and shall give full information to the General Contractor sufficiently in advance. He shall furnish all supports herein specified, so that the General Contractor may build same in place. In the case of failure on the part of the Contractor to give proper information as noted above, he shall assume the cost of having the work done by others.
- F. All HVAC equipment shall be delivered to the site in the original sealed containers or packages bearing the manufacturer's name and brand designation. Piping shall be cleaned inside to remove dirt and loose scale, etc. Water piping shall be flushed out prior to testing of equipment. All open ends of pipe shall be capped or plugged during the construction period to prevent entrance of foreign materials. No pipe shall be installed outside of the building or in an exterior wall unless adequate provision is made to protect such pipe from freezing. Escutcheons shall be provided for all exposed piping passing through finished wall, floor or ceiling assemblies. Ductwork and casing shall be cleaned on the inside before fans are operated. After the equipment has been used for any purpose, such as adjusting, testing or temporary ventilation, filters shall be replaced with new filters. The General Contractor shall at all times protect his work, materials and equipment from any loss or damage.
- G. All equipment, ducts and piping shall be supported from the building structure. In general, all equipment, ducts and piping shall be installed concealed above ceilings or in walls, except as otherwise noted on the Drawings.
- H. Natural gas piping, valves, fittings including connections to gas boilers.
- I. All motors, controls, and wiring provided from factory, shall be UL tested and labeled. All field installed 120 VAC control panels are also required to bare a UL label, for the tested assembly no field modifications to UL tested and labeled assemblies shall be permitted.

1.3 ELECTRICAL WORK

- A. Electrical equipment furnished by this Contractor and wired under Division 26, Electrical.
 - 1. Motors, magnetic starters with auxiliary contacts and other controls of devices for all packaged units.
 - 2. Disconnect switches when specified to be furnished with equipment.
 - 3. Line voltage relays and thermostats.
 - 4. Control panels for packaged equipment, including VFD's with integral disconnects where specified.
 - 5. Variable Frequency Drives: Line voltage side to be wired by division 26.
- B. Electrical equipment furnished, installed and wired by this Contractor:
 - 1. Low voltage controls, including relays.
 - 2. Interlocking and low voltage control wiring between controls, motor starters, relays, damper motors, and miscellaneous controls.
 - 3. All wiring shall be in accordance with Division 26, Electrical.

- C. Electrical equipment furnished, installed and wired under Division 26 work. The Electrical Contractor shall furnish and mount a magnetic motor starter for each motor where motors are not factory furnished in a package which includes motor controls.
- D. Motors:
 - 1. Motors shall be designed voltage and phase shown on the drawings, 60 Hz power, except as otherwise shown on the Drawings. Unless otherwise specified or shown on the Drawings, all motors shall have open drip-proof frames, Class F insulation and continuous duty classification based on a 40 degree C ambient temperature.
 - 2. Motors shall be sized for the service intended and all motors shall have 1.15 service factor. The HP of the motors specified or shown on the Drawings is for guidance. The Contractor shall, at no extra charge to the Owner, make all necessary adjustments, including all electrical work for the equipment furnished by him. Prior to substantial completion, the Contractor shall verify all overloads for all motors furnished by him.
 - 3. Motor Efficiencies for HVAC equipment shall meet or exceed the requirements of the 2011 Vermont Commercial Energy Standard.

1.4 TESTING OF SYSTEMS

- A. General:
 - 1. Each system shall be tested in accordance with the governing regulations and as specified herein. The Contractor shall furnish all certificates of compliance in triplicate to the Engineer.
 - 2. Upon completion of fabrication and before enclosing, insulating or concealing in any way, all piping, mains and joints shall be tested for leaks at one and one-half their normal working pressures.
 - 3. Provide test pumps, meters, gauges and other instruments and materials to test heating, ventilating, exhaust systems, as specified herein.
 - 4. Before testing piping, remove or otherwise protect from damage all specialties and equipment not designed to withstand test pressures.
 - 5. The Contractor shall notify the Engineer, in advance (min. 48 hours) of scheduled tests so that the Engineer may have a representative present during any or all tests. Repeat all tests, as required, to prove system tight and in perfect operating condition.
 - 6. Patch holes in insulation, ductwork, and housings, which have been cut or drilled for test purposes in manner recommended by original installer.
 - 7. All pipe lines shall be blown or flushed clean before tests are conducted.
 - 8. Testing may be done in sections to facilitate construction.
 - 9. The Contractor must accommodate his testing operation to the progress of the project as a whole and correct all defects appearing under tests and repeat the tests until all parts of the work have withstood them successfully. Screwed piping shall be made tight without caulking. When the work is presented for acceptance, all valve stem packing must be new and without leaks and all gauges must be in place and reading accurately. The Contractor shall make and remove all temporary piping connections required for the test and shall dispose of test water and all wastes after tests. He shall leave all work in good order, ready for full use.
- B. Refrigeration Piping Systems:
 - 1. Test and charge all piping systems. Testing shall be done prior to charging system. Fill system with 150 psig of nitrogen on low side and 300 psig on high side. Inspect all joints for four (4) hours, charge with dry nitrogen, evacuate for four (4) hours, and re-charge with nitrogen.

Evacuate for four (4) hours prior to charging. Following approval of pipe test, charge system with R-410a refrigerant as recommended by the manufacturer. Check the entire system for leaks following charging. Allow to stand for 24 hours with system charged to test pressures. If there is no change in gauge reading then system is acceptable. When testing is complete reduce pressure to proper operation pressures and install final charge. Remove control or relief valves which may be subject to damage during testing. Re-install following completion of testing and prior to final charging.

C. Additional Testing Requirements:

1. If during the process of installing the specified systems the Engineer requires additional independent testing to confirm conformance with these specification the contractor shall be responsible for paying for and providing all testing deemed appropriate by the Engineer. Additional testing requirements will be invoked if there is a question relative to quality, workmanship or methods utilized during the installation of the work. The Engineer shall select and approve any or all independent testing agencies required for any and all such testing. The contractor shall also be responsible for all costs associated with removal and replacement of sections of the work required for testing.

1.5 OPERATING TESTS

- A. Conduct operational test of all systems, equipment devices and accessories.
- B. During operating test, arrange and pay for services of qualified and authorized representative of manufacturers of the equipment and controls, as directed by the Engineer. Included in this service will be instructions to the Owner or his representative of the operating and maintenance of respective equipment and controls.
- C. Adjust all automatic temperature controls for satisfactory operation cycles.
- D. Furnish diagrammatic layouts of automatic control systems and a set of printed instructions for their operation and maintenance to the Owner.
- E. Test and set safety and relief valves to specified relief pressure.
- F. Test and adjust all gauges, thermostats, meters and other equipment, after installation, to assure accurate operation.
- G. Adjustments and tests shall be repeated until systems operate in accordance with Contract requirements.
- H. Filters shall be kept in place in all units during operating tests. They shall be placed with new filters and/or new media immediately before the Owner occupies the building.
- I. Engineer shall inspect operating tests only after Contractor has completed them satisfactorily and requested inspection.

1.6 TEST DATA

- A. During operating tests, the Contractor shall record and forward to Engineer, in triplicate, in typewritten form, the following data:
1. Fan coil unit supply, return and fresh air CFM and velocities.
 2. Heat recovery unit supply and exhaust fan CFM.
 3. RPM of all pumps and motor amperage readings.
 4. Factory start-up and test Reports for Boilers.
 5. Factory start-up and test reports for chiller dry cooler and controls.
 6. Systems balancing report complete with air and water flow quantities, RPM of pumps terminal unit water flows.
 7. Temperature rise through all heating equipment.
 8. Temperature drop through all cooling coils.
 9. Final setting on all temperature controls and controllers.
 10. All test data shall be identified in accordance with schedules on the Plans.

1.7 BALANCING

- A. The Contractor shall obtain the services of an independent Certified Testing and Balancing Agency approved by the Engineer that specializes in the testing and balancing of the Air Conditioning Systems. All tests and balancing procedures shall be in accordance with the SMACNA Manual for the Balancing and Adjustment of Air Distribution Systems and as specified herein.
- B. The Testing and Balancing Agency shall provide the following services for this project:
1. Balance all fans.
 2. Balance all ERU's.
 3. Balance all fan coil units.
 4. Test the complete automatic control system for specified sequence of operation and temperature control, including safety and manual operating controls and sensing element locations. This work shall be performed in conjunction with the Control Contractor.
 5. All manually set balancing valves shall have their settings secured and plainly marked when their settings are determined during the test and balancing procedure.
 6. The testing and balancing process shall be conducted on the systems and all installation conditions revealed by this process to be adversely affecting system performance and/or system balance from being obtained shall be listed and reported in the test data.
- C. The Contractor shall cooperate with the Testing and Balancing Agency as follows:
1. Provide sufficient time before expected date of Substantial Completion of the Contract so that testing and balancing can be accomplished.
 2. The Contractor shall provide the Testing and Balancing Agency with a complete set of system design, drawings, specifications, approved shop drawings and equipment submittals including all manuals.
- D. The Contractor shall put all systems and equipment into full operation and shall continue the operation during each working day of testing and balancing.
- E. The Contractor shall verify in writing to the Engineer and the Testing and Balancing Agency that the installation of all components is complete before the testing and balancing process is started. Once the

test and balancing procedure is started, it shall be continued until it is completed or until an installation incompleteness or required correction is discovered, at which time the test and balancing procedure shall be stopped. After the required changes are made to remedy the installation incompleteness or correction, the testing and balancing procedure shall be started again from the very beginning and not just completed from the point of stopping.

- F. The Contractor shall at no additional cost to the Owner have the required changes, corrections and additions made including changes to dampers, sheaves and belts which the balancing report indicates are necessary to obtain required system performance in accordance with Control Drawings and specifications and shall obtain and pay the Testing and Balancing Agency to retest and re-balance systems after all corrections have been made.
- G. The installation shall not be considered complete until the final reports by the Testing and Balancing Agency indicate this to be fact in writing. One (1) electronic copy of these reports shall be submitted to the Engineer for his final approval and acceptance.

PART 2 - PRODUCTS

2.1 PIPE AND FITTINGS

- A. Refrigeration Piping: Furnish and install all refrigeration piping, valves, strainers, solenoid valves, driers, sight glass, charging ports and accessories for a complete and operational system. Contractor must have a minimum of five years of experience in installation of refrigeration piping and accessories. The Contractor shall be responsible for handling of R-410a refrigerant. Only approved reclamation and evacuation equipment shall be used to avoid uncontrolled release of refrigerants. Refrigeration piping shall be hard temper copper, type ACR, using brazed joints. Provide sight glass and filter drier for each refrigeration circuit. Test and purge system as specified. Following system installation charge all systems with R-410a refrigerant as specified.
- B. Condensate Drainage Piping: Schedule 40 PVC. Use drainage pattern fittings.
- C. Fittings:
 - 1. Copper pipe fitting shall be wrought copper solder joints, ANSI B-16.22, streamlined pattern joints and shall be made with "Silverbrite" lead free solder with non-corrosive flux.
 - 2. Malleable-iron threaded fittings where required shall be ANSI B-16.3, Class 300, standard pattern, for threaded joints. Threads shall conform to ANSI B-1.20.1.
 - 3. Unions shall be of the same class and material as the pipe and fittings of the system in which they are installed.
 - 4. Dielectric unions: To prevent corrosion caused by dissimilar materials provide dielectric unions equal to Watts Series 3000, with materials to match piping system. Flanged dielectric fittings shall be equal to Watts Series 3100 with materials to match piping system.
- D. Joining Materials:
 - 1. Brazing materials shall comply with SFA-5.8, Section II, ASME Boiler and Pressure Vessel Code for brazing filler metal materials appropriate for the materials being joined.

2.2 SPECIALTIES

- A. Furnish and install pipe line type thermometers where specified and/or shown on the Drawings.
- B. Thermometers shall be H.O. Trerice Catalog No. A40507 or approved equal, with 9" scale, adjustable angle, and separable socket.
- C. Thermometers shall be installed so as to be easily read while standing on the floor.
- D. Furnish and install pressure gauges where specified and/or shown on the Drawings. Gauges shall be Trerice No. 450B with 4-1/2" dial, range as shown or approved equal to U.S. Gage or Crosby-Ashton. Each gauge shall be provided with a 1/4" ball valve gauge isolation valve. Gauges shall be installed so as to be easily read while standing on the floor. Provide pulsation dampener.

2.3 SUPPORTING DEVICES

- A. General: All piping shall be rigidly supported from the building structure by means of approved hangers and supports. This Contractor shall furnish and install all necessary intermediate support steel and the proper hanging of all piping and equipment. Chains, strap, perforated bar or wire hangers shall not be permitted. Hangers for insulated piping shall be installed outside of insulation and provided with insulation protection saddles. Saddle shall be 12" long, 1/2 the circumference in width and 16 gauge for pipe 3" and larger and 6" long by 20 gauge for pipe 2-1/2" and smaller.
- B. All support components shall conform to Manufacturer's Standardization Society Specification SP-58. The hangers shall adequately support the piping system. They shall be located near or at changes in piping direction and at concentrated loads. They shall provide vertical adjustments to maintain pitch required for proper drainage and allow for expansion and contraction of the piping.
- C. Hangers shall be constructed of malleable or wrought iron. Where in contact with pipe hangers supporting copper pipe shall be copper-plated.
- D. Install all hangers straight and true, and in perfect alignment. Locate no hangers near couplings, fittings or bends in piping without making provisions for expansion.
- E. Where groups of three or more pipes occur, they may be supported with trapeze hangers, using two hangers as specified, with a capped pipe cross member.
- F. For vertical piping, support steel and copper pipe at every floor, with MSS Type 8 riser clamp.
- G. All pipe hangers shall be large enough to encompass the insulation, using a metal galvanized shield, so that vapor barrier jacket will not be broken or crushed.
- H. Inserts in the concrete slab shall be drilled in by the Contractor. Inserts driven in by explosive charges shall not be permitted. Inserts shall be of the type to receive a machine bolt or threaded rod.
- I. Provide insulation saddles as required herein.

J. Hangers for horizontal hanging piping shall be as follows:

1. Steel Piping

PIPE SIZE	MSS TYPE
3" and Smaller	Adjustable Band, Type 7
4" and Larger	Adjustable Clevis, Type 1

2. Copper Piping

PIPE SIZE	MSS TYPE
2" and Larger	Adjustable Clevis, Type 7
1-1/2" and Smaller	Split Ring, Type 6 or 12

3. PVC Piping

PIPE SIZE	MSS TYPE
2" and Larger	Adjustable Clevis, Type 7
1-1/2" and Smaller	Split Ring, Type 6 or 12

K. Horizontal hanging piping shall be supported as follows:

1. Steel Pipe:

PIPE SIZE	ROD DIA.	MAX. SPACING
4" and Larger	1/2"	At Each Hub
2" and 3"	3/8"	At Each Hub

2. Copper Pipe:

PIPE SIZE	ROD DIA.	MAX. SPACING
1-1/2" to 2"	3/8"	10'
1" and Smaller	3/8"	8'

3. PVC Pipe:

PIPE SIZE	ROD DIA.	MAX. SPACING
2-1/2" and Larger	1/2"	10'
1-1/2" to 2"	3/8"	8'
1" and Smaller	3/8"	6'

2.4 PIPE SLEEVES

- A. Furnish and set sleeves to accommodate pipes passing through foundations, walls, floors, furring and ceilings. Cooperate with other Contractors in setting all sleeves. Sleeves shall be full thickness of construction.

- B. Sleeves shall be large enough to permit free movement of pipe where expansion and contraction occur and to permit insulation to run continuous. Provide U.L. listed fire barrier seals in floor, walls, ceilings, etc., at all penetrations of fire rated construction. Fill annular space between pipe and sleeve with U. L. approved fire retarding packing, rated for 1 hour minimum. See fire stopping details on the drawings.
- C. Sleeves through exterior walls below grade, through foundation walls, shall be watertight construction. Use "Link-seal", compression type neoprene link seals installed in sleeve or core drilled hole.
- D. Sleeves for steel pipe through exterior masonry wall, floors on grade and through fire partitions shall be of galvanized steel pipe, at least two pipe sizes larger than pipe passing through. Sleeves through interior walls and floors, ceilings, furring and partitions shall be steel pipe. Sleeves for copper piping shall be copper pipe, Type "L", minimum 2 sizes larger or large enough to allow for insulation. Fasten sleeves securely in floors, walls and partitions.
- E. All sleeves in exposed locations shall be set so escutcheon plates specified shall cover entire sleeve.

2.5 ACCESS PANELS

- A. The extent of access requirements of mechanical work is indicated on the mechanical work drawings, or is defined by the provisions of this section and other Division 23 sections, and is hereby recognized to be dependent upon the nature of other adjoining work requiring access. The access units required are recognized to include: (1) those units directly indicated in the Contract Documents, (2) those units indirectly indicated in the Contract Documents by way of mechanical work located behind other construction or finishes, and requiring access, and (3) those additional units identified subsequently to the Contract Date, because of the actual manner in which mechanical work with required access is located in relation to other construction and finishes.
- B. Access panels shall be provided in ceilings, except in removable tile, and in walls to permit access to concealed valves, automatic damper operators, etc. Panels for fire dampers shall be of sufficient size to permit opening of the fire damper duct access door. Valve panels shall be 12" by 12" minimum.
- C. The types of access units required as work of this section include removable cover plates and access doors, which may include units in walls, ceilings and floor surfaces. (Fire Rated, if required).
- D. Provide access doors manufactured by one of the following, except as otherwise indicated, minimum size 12" x 12":
 - 1. Milcor Div.: Inryco Inc.
 - 2. Jay R. Smith Mfg. Company
 - 3. Zurn Industries, Inc.
- E. All access panels shall include key operator and all access panels shall operate on the same key. Provide (12) twelve sets of keys.

2.6 FLOOR, WALL AND CEILING PLATES

- A. Escutcheon plates shall be installed on all exposed pipe passing through walls, floors or ceilings. Plates shall be as manufactured by Ritter Pattern and Casting Co., Bridgeport Brass Co., or an approved equal, chrome-plated steel plates with set screw and concealed hinge. Plastic escutcheons are not approved.

PART 3 - EXECUTION

3.1 PIPING

A. General:

1. All pipes shall be round and straight, of required size. Cutting and threading shall be done with proper tools and pipes shall be reamed to full size after cutting.
2. Pipe sizes shown on the Drawings are nominal pipe sizes and not outside diameters unless specifically noted otherwise. Pipes shall be run substantially as indicated on the Drawings; however, Architect/Engineer reserves the right to require this Contractor to make minor changes in pipe locations where conflicts occur with other trades or existing conditions. Such changes shall be made without extra cost to Owner.
3. All pipes shall be run with proper grade to provide for easy draining and in group runs, where applicable, and in a neat and orderly manner, to the satisfaction of the Architect/Engineer.
4. Piping shall be installed with ample provisions for expansion and contraction to prevent injury to the same and to the building construction. Furnish expansion loops, where indicated or necessary, on long runs and anchors to permit proper loop deflection.
5. In general, unions are not indicated on the Drawings, but shall be provided in the following locations:
 - a. At pipe mounted equipment, valves or coils
 - b. Connections to all radiation, coils, pumps and other equipment requiring isolation for service or repairs.
 - c. Do not conceal unions in wall, partitions or ceilings except where access is available through removable ceiling tiles or access panels.
6. No piping shall be installed so as to cause an unusual noise from the flow therein under normal operation. Grade piping for complete drainage. Provide drain valves at all low points.
7. Ream or file each pipe cut to remove burrs. Inspect each length of pipe and each fitting for workmanship and clear passageway. Caulking of threads will not be allowed on any piping.
8. Keep piping free of dirt, scale. Cover, cap or otherwise protect open ends of all piping during construction to prevent damage to threads or flanges and to prevent entry of foreign matter.
9. All piping through finished areas shall be carried in partitions, chases, or in recesses where provided in walls, through floors and in furred or hung ceilings. Run exposed pipes only where indicated or directed.
10. Where changes in pipe sizing occur, use only reducing eccentric type fittings, top of pipes flat. No bushings will be allowed.
11. No piping shall pass through ductwork, sheet metal work or structural steel unless approved by the Architect or Engineer.
12. Clean exterior surfaces of installed piping systems of superfluous materials, and prepare for application of specific coatings (if any). Flush out piping systems with clean water before proceeding with required tests. Inspect each run of each system for completion of joints, supports and accessory items.

3.2 HANGER, SUPPORTS AND ANCHORS

- #### **A.**
- 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.

- B. 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.
- C. 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 supports with maximum spacings complying with MSS SP-69. 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 support piping from other piping.
- D. Provide all necessary inserts, bolts, rods, nuts, washers and other accessories. Except as otherwise indicated for exposed continuous pipe runs, install hangers and supports of same type and style as installed for adjacent similar piping.
- E. Prevent electrolysis in support of copper tubing by use of hangers and supports which are copper plated.
- F. Install hangers and supports to allow controlled movement of hangers and supports which are copper plated.
- G. Load Distribution: Install hangers and supports so that piping live and dead loading and stresses from movement will not be transmitted to connected equipment.
- H. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes.
- I. Insulated Piping: Comply with the following installation requirements:
 - 1. Clamps: Attach clamps, including spacers to piping with clamps projecting through insulation.
 - 2. Shields: Where low-compressive-strength insulation or vapor barriers are indicated install coated protective shields.
- J. Adjust hangers and supports as required under supports to bring piping to proper levels and pitch.

3.3 PIPE SLEEVES INSTALLATION

- A. Install pipe sleeves of the types indicated where piping passes through walls, floors, ceilings, roofs and structural members of the work. Provide sleeves of adequate size, accurately centered on pipe runs. Size sleeves so that piping and insulation (if any) will have free movement in the sleeve, including allowance for thermal expansion. Where insulation includes a vapor barrier covering, provide sleeve with sufficient clearance for installation of vapor barrier, but not less than 2 pipe sizes larger than piping run. Install length of sleeve equal to thickness of construction penetrated. Provide temporary support of sleeves during placement of concrete and other work around sleeves, and providing temporary closure to prevent concrete and other materials from entering pipe sleeves. All wall pipe penetrations shall be fire stopped for 1 Hour rating.
- B. Provide "Link-seal" units at all pipe sleeves penetrating at exterior walls below grade.
- C. Install escutcheon plates at pipe sleeves where piping is exposed to view in occupied spaces of the building, on the exterior, and elsewhere as indicated.

3.4 VALVES

- A. Install valves where required for proper operation of piping and equipment, including valves in branch lines where necessary to isolate sections of piping. Locate valves so as to be accessible and so that separate support can be provided when necessary.
- B. Install valves with stems pointed up, in the vertical position where possible, but in no case with stems pointed downward from a horizontal plane.
- C. Where insulation is indicated, install valves, arranged in the proper manner to receive insulation, provide handle extensions as specified.

END OF SECTION 23 0510

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 230719

MECHANICAL SYSTEMS INSULATION

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. Related Work Specified Elsewhere:

1. Refer to all Sections of DIVISION 1 - GENERAL REQUIREMENTS, which are hereby made part of this Section of the Specifications.
2. Excavation and Backfill are specified in Division 31.
3. Concrete Work is specified in Division 3.
4. Flashing of Mechanical Work passing through membrane roof is specified in Division 7.
5. Finish Painting is specified in Division 9.
6. Plumbing Work is specified in Division 22.
7. Electrical Work is specified in Division 26.

B. Related Documents:

1. The General Provisions of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in this Section.
2. The requirements of Section 23 0500 govern the work specified in this Section, where applicable.

1.2 DESCRIPTION OF WORK

A. Work Included: Provide labor, materials, and equipment necessary to complete the work of this Section, including but not limited to the following:

1. Refrigeration Piping
2. Ductwork Exterior Insulation

1.3 QUALITY ASSURANCE

A. Manufacturers: Provide insulation products produced by one of the following for each type and temperature range of insulation:

1. Armacell
2. Rubatex
3. Owens-Corning

B. Flame/Smoke Ratings: Provide composite insulation (insulation, jackets, coverings, sealers, mastics and adhesives) with flame-spread rating of 25 or less and a smoke-developed rating of 50 or less, as tested by ASTM E84 (NFPA 255) method.

- C. All heating and cooling piping shall be installed with vapor barrier insulation materials, installed per the manufacturer's instructions to maintain a continuous vapor barrier. Insulation shall be continuous at all specialties, hangers, valves and fittings. All fittings shall be mitered and sealed with a vapor sealing mastic.
- D. Submit manufacturer's data on insulation indicating certification or other data as necessary to show compliance with these specifications and governing regulations. Include proof of compliance for tests of products for fire rating, corrosiveness, and compressive strength.
- E. Deliver insulation, coverings, cements, adhesives and coatings to the site in factory-fabricated containers with the manufacturer's stamp, or label, affixed showing fire hazard ratings of the products. Store insulation in original wrappings and protect from weather and construction traffic.
- F. All adhesives and sealants shall be Low VOC complying with LEED requirements.

PART 2 - PRODUCTS

2.1 PIPE INSULATION

- A. Refrigeration piping shall be insulated with 1" thick Armaflex insulation, or approved equal, (or per manufacturer's installation requirements, whichever is more stringent), seal all seams to maintain vapor barrier. Provide additional aluminum jacketing for exterior refrigerant piping. Secure to pipe with aluminum straps min. 2'-0" O.C.
- B. All dry suction system and compressed air intake and condensate piping shall be insulated with Manville FLAMESAFE fiberglass pipe insulation, Owens-Corning fiberglass 25, or approved equal as specified below. The insulation shall have an average thermal conductivity not to exceed .25 BTU in. per sq. ft. per F. per hour at a mean temperature of 75 degrees F. Thickness of the insulation shall be as scheduled below. Jacket shall be ASJ. The insulations shall be applied over clean dry pipe with all joints firmly together. Longitudinal jacket laps and the butt strips shall be smoothly secured with self-sealing longitudinal lap joints.
- C. Pipe insulation for Dry Suction System and Compressed Air intake shall be provided with an ADDITIONAL JACKET made of high impact polyvinyl chloride 10 mil thickness, applied over specified insulation, using vapor barrier mastic-adhesive. Piping located in Boiler and Mechanical rooms are not required to be provided with additional jacket.

2.2 DUCTWORK INSULATION

- A. All ducts requiring thermal treatment shall be insulated with CertainTeed Duct Wrap 150 with Foil Scrim Kraft (FSK) vapor retarder facing, or an approved equal. The insulation shall have a k-value of 0.24 respectively at 75 degree F mean temperature. Thickness and R-value of the insulation shall be as installed. Installed thicknesses and R-values shall be based on 25% compression of the wrap. Sheet metal ductwork shall be clean, dry and sealed tightly prior to insulating with Duct Wrap. To ensure installed thermal performance, Duct Wrap shall be cut to stretch-out dimensions. This requires measurement of the duct perimeter, then cutting the duct wrap to the dimension (perimeter + add-on) indicated in the manufactures stretch-out chart. Insulation shall be removed from the facing at the end of the piece of insulation to form an overlapping stapling and taping flap. The duct wrap is installed with the facing out. Adjacent sections of duct wrap shall be tightly butted with the stapling and taping flap overlapping. Seams

shall be stapled approximately 6. o.c. with steel outward clinching staples. Where rectangular ducts are 24. in width or greater, duct wrap insulation shall be additionally secured to the bottom of the duct with mechanical fasteners spaced 18. o.c. to prevent sagging. All seams shall be sealed with pressure-sensitive tape matching the insulation facing. Seal all tears, punctures, and/or other penetrations of the duct wrap facing with tape or mastic to provide a vapor-tight system.

B. Ductwork Insulation Schedule:

1. Energy Recovery Units:
 - a. Outdoor Air Intake – 3" thick.
 - b. Exhaust Air Discharge to exterior – 3" thick
 - c. Ventilation Air Supply – None
 - d. Return air to ERU – none
2. Fan Coil Supply and Return Ductwork:
 - a. Supply Air Ductwork – 1-1/2" thick.
 - b. Supply Air Ductwork exposed in finish spaces – none.
 - c. Return Air Ductwork – none.
3. Louver Plenum:
 - a. 3" thick

PART 3 -EXECUTION

3.1 INSULATION

- A. Insulation shall not be omitted on ducts and piping concealed behind walls or ceilings. Covering shall be applied before masonry proceeds. Longitudinal seams on jackets shall be located so that they are not visible from the floor. Remove all stickers from covering.
- B. Insulation shall be applied over clean pipe with all joints butted firmly together and sealed with butt strips.
- C. Insulation shall run through all hangers and sleeves and have an 18 gauge sheet metal saddle equal to three (3) times the pipe diameter in length. All pipes 3" and larger in diameter shall be supported through insulation by fitting a protection saddle to the thickness of the insulation. Protection saddle shall be equal to Grinnell Co. Figure 160 to Figure 165A insulation shield protection saddles.
- D. All fittings, valves, etc. shall be insulated with the proper factory precut insulation.
- E. Covering shall not be applied until all parts of the work have been tested by Contractor and approved by the Architect/Engineer.
- F. On exposed insulation, all longitudinal seams shall be kept at the top of the pipe and circumferential joints shall be kept to a minimum. Raw ends of insulation shall be concealed by neatly folding in the ends of the jackets. Fittings, valve bodies, and flanges shall be furnished with the same jacket materials used on adjoining insulation.

END OF SECTION 23 0719

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 23 0900

TEMPERATURE CONTROLS

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. Related Work Specified Elsewhere:
 - 1. Refer to all Sections of DIVISION 1 - GENERAL REQUIREMENTS, which are hereby made part of this Section of the Specifications.
 - 2. Excavation and Backfill are specified in Division 31.
 - 3. Concrete Work is specified in Division 3.
 - 4. Flashing of Mechanical Work passing through membrane roof is specified in Division 7.
 - 5. Finish Painting is specified in Division 9.
 - 6. Plumbing Work is specified in Division 22.
 - 7. Electrical Work is specified in Division 26.
- B. Related Documents:
 - 1. The General Provisions of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in this Section.
 - 2. The requirements of Section 220500 govern the work specified in this Section, where applicable.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide Labor, Material, and Equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Automatic temperature control system installed with all incidentals necessary for a complete operational system. The system shall include all equipment necessary to provide fully automatic and manual control of all environmental systems as shown on Drawings and described in this specification. The system shall be complete in all respects, including space thermostats and/or space sensors, all interlocks between all systems as required, and such other standard accessories and services necessary for a complete approved system.

1.3 GENERAL REQUIREMENTS

- A. The temperature control system for this project shall be standalone in nature. See Control Sequences of Operation in Section 2 below.
- B. All wiring, conduit, junction boxes, fittings, etc. necessary for the temperature control system shall be furnished and installed by this Contractor and shall conform to all standards and codes as described under Division 26, Electrical. All control circuits shall be 24 volts.

- C. Provide nameplates for all control devices. Devices on panels to have "Lamicaid" nameplates; isolated control valves, relays, etc. to be marked with stamped tape.

1.4 SCOPE

- A. This Contractor shall furnish and install all equipment, accessories, wiring, instruments, and piping required for a complete and functioning system.
 - 1. All materials and equipment used shall be standard components, regularly manufactured for this and/or other systems and not custom designed especially for this project. All components shall have been thoroughly tested and proven in actual use.
 - 2. This Contractor shall provide a list of not less than five (5) similar projects which have building control systems as specified.
- B. Wiring: All temperature control wiring will be installed and terminated by this Contractor. Control wiring shall be as follows:
 - 1. All circuits which are activated or de-activated by temperature control system components, such as, but not limited to, high and low limit protective devices.
 - 2. All circuits which activate or de-activate temperature control system components.
 - 3. All temperature control panel wiring to terminal strips and field wiring from terminal strips to field mounted devices.
 - 4. All wiring to the "Auto" side of hand-off auto switches on units being controlled by the ATC Contractor.
 - 5. Wiring of all electro-mechanical devices required to be located on or in temperature control panels.
- C. All wiring shall comply with National, State, and Local Electrical Codes. All power wiring will be installed and terminated by the Electrical Contractor. Power wiring shall be defined as follows:
 - 1. Wiring of all devices and circuits carrying 120 voltages or greater.
 - 2. Wiring of power feeds to all disconnects starters, and electric motors.
 - 3. Wiring of 120 VAC power feeds to all temperature control panels where required.
 - 4. Installation of and wiring of line power to fused disconnects for each pump.
 - 5. Power wiring to 120V single phase motors.
- D. Related Work - Work by Others:
 - 1. Painting: All finished painting required for control piping and equipment shall be done by the General Contractor.

1.5 GUARANTEE AND INSTRUCTION

- A. The control system herein specified shall be free from defects in workmanship and material under normal use and service. Any equipment proved to be defective in workmanship and material is to be adjusted, repaired, or replaced free of charge. Guarantee becomes effective from date of acceptance by the Owner. When the Owner receives beneficial use of the system or part, the guarantee shall start for that portion only, also subject to acceptance by the Owner.

PART 2 - PRODUCTS

2.1 BUILDING EQUIPMENT

- A. Electronic Temperature Sensors: Vibration and corrosion resistant for wall, immersion, or duct mounting as required.
 - 1. Resistance Temperature Detectors: Platinum, thermistor, or balco
 - a. Accuracy: Plus or minus 0.2 percent at calibration point; thermistors shall have a maximum 5 year drift of no more than .225°F maximum error of no more than .36°F
 - b. Wire: Twisted, shielded-pair cable
 - c. Averaging Elements in Ducts: 60 inches, long, flexible for use where prone to temperature stratification or where ducts are larger than 4 sq. ft.; 264 inches long, flexible for use where prone to temperature stratification or where ducts are larger than 16 sq. ft; length as required.
 - d. Insertion Elements for Liquids: Brass socket with minimum insertion length of 2-1/2 inches.
 - e. Outside-Air Sensors: Watertight inlet fitting, shielded from direct sunlight.
 - f. Room Security Sensors: Stainless-steel cover plate with insulated back and security screws.
- B. Electronic Damper Actuators:
 - 1. Electronic damper shall be spring return motor actuator type. A break mechanism shall prevent the return spring from driving the motor actuator toward its normal position unless the power is interrupted.
 - 2. The motor assembly shall include electric/electronic contacts, hardware, and brackets to allow proper motion and operation.
 - 3. The motor assembly shall include the necessary hardware and brackets to allow proper mounting and connection to a standard 1/2" diameter damper shaft or damper blade.
 - 4. Actuators shall be Belimo, or approved equal. Electronic Valve/Damper Position Indication: Visual scale indicating percent of travel and 2- to 10-V dc, feedback signal.
- C. Relays: Provide all necessary RIB relays for control of equipment. Relays shall include pilot light and manual HOA switch. Rating and voltage of relays shall be determined for each application. All relays shall be UL Listed.
- D. Room Sensors (Thermostats): These shall be provided with the Cold Climate Heat Pump and Fan Coil Unit package.

2.2 FREEZESTATS FOR LOW TEMPERATURE PROTECTION (AS REQUIRED)

- A. Two position snap-acting, auto-reset, low temperature protection thermostats shall be provided for each heating coil where the possibility exists that the coil could be exposed to sub-freezing air temperature. The thermostat capillary shall have a minimum sensitive length of 20', and shall be installed in serpentine fashion not less than 24" down-stream from the coil it is protecting. Each square foot of coil shall be protected by a section of low temperature detection thermostat capillary. Reset shall be initiated through the DDC control system. Freezestat shall auto reset two times and then the system shall hard lockout and an alarm shall be sent via the DDC system.

2.3 CONTROL SEQUENCES OF OPERATION

- A. MC shall review with Owner the Occupied and Unoccupied Times for the Dental Clinic prior to setting up occupancy schedules discussed below.
- B. Vertical Ducted Fan Coil Units and Cold Climate Heat Pumps
 - 1. Vertical ducted fan coil unit shall be provided and installed in the Warm Attic space serving the associated zones below.
 - 2. Each fan coil unit shall be setup to run fan "continuously" during occupied mode.
 - 3. ERU ventilation air shall be ducted return/return with the supply air and return air; see ERU below.
 - 4. Thermostat shall be set to 70degF heating and 75degF cooling during occupied mode.
 - 5. Thermostat shall be set to 65degF heating and 80degF cooling during unoccupied mode.
 - 6. On a call for heating or cooling from the space thermostat a signal shall be sent to energize the associated cold climate heat pump unit.
 - 7. Note: this system is either in heating mode or cooling mode. There is no simultaneous heating/cooling with the specified equipment.
- C. Energy Recovery Unit
 - 1. ERU shall run continuously during occupied mode and shall be OFF during unoccupied mode.
 - 2. ERU ventilation air ductwork shall be ducted into the return on the associated fan coil unit or direct to the spaces as reflected on the plans.
 - 3. Timeclock shall be provided and installed in the mechanical room on the wall.
- A. Elevator Machine Room Exhaust Fan EF-1
 - 1. EF-1 shall operate off a cooling only thermostat. If the temperature is above 80degF (adjustable), the fan shall be energized.
- B. Vestibule/Stairwell Electric Heater
 - 1. A 120V single pole thermostat shall be provided on the wall as shown on the plans.
 - 2. A clear lockable cover shall be provided for the thermostat.
 - 3. The thermostats to be set to 65degF (adj.).
- C. Baseboard Electric Heaters
 - 1. A 120V single pole thermostat shall be provided on the wall as shown on the plans.
 - 2. A clear lockable cover shall be provided for the thermostat.
 - 3. The thermostats to be set to 65degF (adj.).
- D. Water Heater, WH-1
 - 1. Water Heater shall be setup to maintain a storage water temperature of 140degF (adj.).
 - 2. On a call for tank heating the heat pump or electric element shall be energized.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that duct, pipe, and equipment mounted devices and wiring are installed before proceeding with installation.

3.2 INSTALLATION

- A. On completion of the job, this Contractor shall completely adjust, ready for use, all thermostats, and relays provided under his contract and be present for functional tests of the systems. This Contractor shall provide a complete instruction manual covering the function and operation of all control components on the job which shall include a trouble-shooting and operating procedure. A competent technician shall be provided for instruction purposes. Refer to Mechanical Section for "Testing, Adjusting, and Balancing", and cooperate with other Contractors in this phase of the work as required.
- B. Control system shall neither be considered complete nor acceptable until all conditions of the sequence of operation have been attached and all temperatures are maintained within specified limits at all operating conditions.
- C. Provide coordination with equipment manufacturer, Mechanical Contractor and Electrical Contractor for proper sequence of operation.
- D. Installation shall include the following:
 - 1. Install all equipment level and plumb.
 - 2. Connect and configure equipment and software to achieve sequence of operation specified.
 - 3. Verify location of thermostats, and other exposed control sensors with plans and room details before installation. Locate all 60 inches above the floor, except ADA unit (mount at ADA height).
 - 4. Install labels and nameplates to identify control components according to Division 23 Section "Basic Mechanical Materials and Methods."
 - 5. Install labels and nameplates to identify control components according to Division 23 Section "Mechanical Identification."

3.3 ELECTRICAL WIRING AND CONNECTION INSTALLATION

- A. Install raceways, boxes, and cabinets according to NEC.
- B. Install building wire and cable according to NEC.
- C. Install signal and communication cable according to NEC. Conceal cable, except in mechanical rooms and areas where other conduit and piping are required and as follows:
 - 1. Install exposed cable in conduit.

2. Install concealed cable in raceway.
 3. Bundle and harness multi-conductor instrument cable in place of single cables where several cables follow a common path.
 4. Fasten flexible conductors, bridging cabinets and doors, along hinge side; protect against abrasion. Tie and support conductors.
 5. Number-code or color-code conductors for future identification and service of control system, except local individual room control cables.
- D. Connect manual-reset limit controls independent of manual-control switch positions. Automatic duct heater resets may be connected to the interlock circuit of power controllers.
- E. Connect hand-off-auto selector switches to override automatic interlock controls when switch is in hand position.

3.4 CONNECTIONS

- A. Piping installation requirements are specified in other Division 23 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
1. Install piping adjacent to the machine to allow service and maintenance.
- B. Ground equipment.
1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.5 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including piping and electrical connections. Report results in writing.
1. Operational Test: After electrical circuitry has been energized, start units to confirm proper unit operation. Remove malfunctioning units, replace them with new units, and retest.
 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment, and retest.
- B. Replace damaged or malfunctioning controls and equipment.
1. Start, test, and adjust control systems.
 - a. Demonstrate compliance with requirements, including calibration and testing, and control sequences.
 - b. Adjust, calibrate, and fine tune circuits and equipment to achieve sequence of operation specified.

3.6 FOLLOW-UP ON-SITE ASSISTANCE

- A. Occupancy Adjustments: Within one year of date of Substantial Completion, provide up to two, separate, 4-hour, Project site visits, when requested by Owner or the Engineer, to adjust and calibrate components and to assist Owner's personnel in making program changes and in adjusting sensors and controls to suit actual conditions.

3.7 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain control systems and components.
 - 1. Train Owner's maintenance personnel on procedures and schedules for starting and stopping, troubleshooting, servicing, and maintaining equipment and schedules.
 - 2. Review data in maintenance manuals. Refer to Division 1 Section "Operation and Maintenance Data."
 - 3. Schedule training with Owner, through Engineer, with at least seven days advance notice.

3.8 TRAINING

- A. Provide a minimum of 8 hours of on-site or classroom training throughout the contract period for personnel designated by the Owner. Each session shall be a minimum of four hours in length and must be coordinated with the building Owner. Train the designated staff of Owners Representative and Owner.

3.9 PROJECT COMPLETION REQUIREMENTS

- A. On completion of the job, this Contractor shall completely adjust, ready for use, all thermostats, and relays provided under his contract and be present for functional tests of the systems. This Contractor shall provide a complete instruction manual covering the function and operation of all control components on the job which shall include a trouble-shooting and operating procedure. This manual shall be furnished to the Owner and shall show the total integrated control system. A competent technician shall be provided for instruction purposes. This Contractor shall furnish framed schematic control diagrams to be located in their appropriate Mechanical Room adjacent to the Temperature Control Panel. Refer to Mechanical Section for "Testing, Adjusting, and Balancing", and cooperate with other Contractors in this phase of the work.
- B. Before the Engineer is asked to supervise and/or witness the adjustments called for in this specification, the Control Contractor through the Mechanical Contractor shall state in writing that the entire system is complete, that the controls have been calibrated and that the controlled devices and/or equipment have been physically inspected and checked to assure that these terminal devices are in fact under proper control and working smoothly over their entire range of operation.
- C. Control system shall neither be considered complete nor acceptable until all conditions of the sequence of operation have been attached and all temperatures are maintained within specified limits at all operating conditions.

3.10 GUARANTEE AND INSTRUCTION

- A. After completion of the control system installation, regulate and adjust all thermostats, controllers, etc., and place them in complete operating conditions. Instruct operating personnel, for winter cycle and for summer cycle.
- B. The control system herein specified shall be free from defects in workmanship and material under normal use and service. Any equipment proved to be defective in workmanship and material is to be adjusted, repaired, or replaced free of charge for One Year after final acceptance of the system. Guarantee becomes effective from date of acceptance by the Owner. When the Owner receives beneficial use of the system or part, the guarantee shall start for that portion only, also subject to acceptance by the Owner.

END OF SECTION 23 0900

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 23 3113

AIR DISTRIBUTION SYSTEMS AND EQUIPMENT

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. Related Work Specified Elsewhere:

1. Refer to all Sections of DIVISION 1 - GENERAL REQUIREMENTS, which are hereby made part of this Section of the Specifications.
2. Excavation and Backfill are specified in Division 31.
3. Concrete Work is specified in Division 3.
4. Flashing of Mechanical Work passing through membrane roof is specified in Division 7.
5. Finish Painting is specified in Division 9.
6. Plumbing Work is specified in Division 22.
7. Electrical Work is specified in Division 26.

B. Related Documents:

1. The General Provisions of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in this Section.
2. The requirements of Section 23 0500 govern the work specified in this Section, where applicable.

1.2 DESCRIPTION OF WORK

A. Work Included: Provide labor, materials, and equipment necessary to complete the work of this Section, including but not limited to the following:

1. Ductwork systems for fan coils
2. Ductwork systems for energy recovery systems
3. Ductwork for exhaust fans.
4. New air distribution system including dampers, grilles, registers and diffusers and accessories
5. Testing and balancing of air systems.

1.3 CODES AND STANDARDS

A. Air distribution systems and equipment shall comply with the following as applicable:

1. Electrical: Provide electric motors and products which have been listed and labeled by Underwriter's Laboratories and comply with NEMA Standards.
2. Comply with National Electrical Code (NFPA No. 70) as applicable to installation of fan motors and associated electric wiring and equipment.

B. Fans

1. Comply with Air Movement and Control Association Standards pertaining to testing, performance and sound ratings of fans.
2. Comply with SMACNA's duct construction standards.
3. Provide fans whose performance, under specified conditions, is certified by manufacturer.

C. Sheet Metal Ducting

1. Comply with SMACNA recommendations for fabrication, construction and details and installation procedures, except as otherwise indicated in these specifications.
2. Comply with ASHRAE recommendations, except as otherwise indicated in these specifications.

D. Dampers

1. Comply with AMCA Standard 500-75, "Test Methods for Dampers and Shutters", as applicable testing performance.
2. Comply with National Electrical Code (NFPA 70), as applicable to electrically operated dampers.
3. Except where more stringent leakage limitation is indicated, provide dampers with leakage limited to 10 CFM per sq. ft., at 4" W.G. static pressure.
4. Comply with SMACNA duct construction standards as applicable and damper installation requirements of N.F.P.A.

1.4 SUBMITTALS

- A. Submit complete manufacturer's data and shop drawings on Air Distribution Systems and Equipment in accordance with requirements of Section 23 0500, include the following:
1. Duct Construction Methods and Materials
 2. Grilles, Registers and Diffusers.
- B. Product Data: Submit manufacturer's technical data for all equipment, including specifications, capacity ratings, dimensions, weights, materials, accessories furnished and installation instructions.
- C. Shop Drawings: Submit assembly-type shop drawings showing equipment dimensions, construction details, methods of assembly of components and field connection details.
- D. Submit manufacturer's electrical requirements for power supply wiring to power equipment. Submit manufacturer's ladder-type wiring diagrams for interlock and control wiring. Clearly differentiate between portions of wiring that are factory-installed and portions to be field-installed.
- E. Submit maintenance data and parts list for each piece or type of equipment, accessory, and control. Include this data and product data in maintenance manual; in accordance with requirements of Section 23 0510.

PART 2 - PRODUCTS

2.1 SHEET METAL DUCTWORK

- A. Air distribution systems for energy recovery systems, fan coils, shall be constructed for 2" w.g. pressure class per SMACNA duct construction standards. Duct gauges, reinforcement methods, joint construction and intermediate reinforcement methods shall meet SMACNA standards for 2" w.g. positive or negative pressure. Submit construction methods for review and approval prior to fabrication of duct systems. Ductwork sealing methods for these systems shall be Class C seal for 2" w.g. and up. Seal all traverse joints.
- B. All duct runs shall be checked for clearances before installation of any ductwork. Above hung ceilings, duct locations, and elevations must be coordinated with work of other trades to avoid conflicts with structure, piping, conduit, and light fixtures.
- C. All sheet metal ducts shall be constructed of galvanized iron sheet of bend forming quality.
- D. Duct construction shall be in accordance with best practices and latest SMACNA requirements for metal gauges, joints, reinforcing, and supports except where specified otherwise in these specifications. All exposed ductwork shall be constructed and hung to provide a neat, smooth, finished appearance. Cadmium plated sheet metal screws shall be used on all exposed ductwork. Ducts shall be free from thumping or rattling when fans are turned on or off.
- E. 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, oil canning, stains and discoloration, and other imperfections, including those which would impair painting.
- F. Duct sizes shall be strictly followed and no changes in shape or dimensions shall be made by this Contractor without first obtaining approval from the Architect/Engineer, except that ducts shall be offset as required to clear structural members and to coordinate with other trades. Any duct changes made must meet the latest ASHRAE and SMANCA Standards.
- G. The centerline radius of all duct elbows where shown on drawings shall be at least one and one-half the width of the duct. Where building conditions do not allow for this radius, provide square duct turns with doubled wall turning vanes in the supply or exhaust air ducts.
- H. Sheet metal screws 3/4" No. 10 may be used to attach stiffener angles to ductwork to secure seams, spaced not over 12" on centers and not less than two per side of 12" or more, except where specified otherwise. Button punching shall not be used except for pre-erection attachment of fittings.
- I. Provide hinged galvanized steel access and inspection doors opposite each duct mounted control device and damper. Doors shall be equal to Buensod-Stacey Type S-2 of rigid construction with cast type rotary latches. Where space limitations do not allow full swing of the access door, two rotary type latches shall be used. Doors located in insulated ducts shall be furnished with extended frames to serve as a stop for insulation. Insulate doors located in insulated ductwork. All doors shall be gasketed. Door shall be 12" x 12" minimum except where limited by duct width and shall be larger where necessary for access to fire damper fusible links or other devices.
- J. Hangers for all rectangular ducts 4 sq. ft. in area or above shall be round bar type fastened to 1-1/4" by 1-1/4" by 1/8" angles under the ducts. Ducts less than 4 sq. ft. in area shall be hung with 1" galvanized straps bent 1" under bottom side of the duct and fastened to the duct with sheet metal

- screws, using not less than two screws per side and as many more so that they are not greater than 6" centers.
- K. Hangers are to be placed on not greater than 8'-0" center.
 - L. Duct joint sealing, reinforcing, flanges, etc. for square sheet metal ducts shall be based on maintaining airtight ducts with maximum of 5 percent leakage of total fan capacity, 1/2 of one percent for round and oval ducts. All joints in round and rectangular ductwork shall be sealed with U.L. Classified United Duct Sealer, or other approved sealing methods.
 - M. Upon completion of construction and before testing, the interior of all plenums shall be vacuum cleaned. When unit is first turned on, open duct access doors and blow out all foreign matter. Do not run fan without filter.
 - N. Seal all new ductwork with united McGill water based duct sealer or other approved methods. Duct sealing and leakage testing shall be inspected by the engineer prior to installation of new ceilings.
 - O. All penetrations of walls shall be closed using 1 1/2" x 1 1/2" 20 gauge galvanized angles screwed to duct and wall.
 - P. Round air distribution ductwork shall be equal to United McGill, "Uni-seal" spiral lockstream, galvanized steel ductwork, or an approved equal. Fittings shall be United McGill uni-seal fittings or approved equal. Duct gauges shall be based on United McGill positive or negative 2" pressure Class "A" standards. Exposed ductwork shall be sealed on the interior and shall be free from tool marks, dents, digs or other surface irregularities. Exposed spiral ductwork will be painted as directed by Architect.
 - Q. Seal all exposed ductwork on the interior.

2.2 FLEXIBLE AIR DUCT

- A. Flexible air duct shall be Buckley, Thermoflex, Cleveflex, or equal and shall be equal to Buckley low pressure "FABRI-FLEX", flexible UL listed duct.
- B. Flexible duct shall be manufactured from aluminum and formed into a multiple corrugated construction; supply duct shall be encased with 1", 3/4 pound density fiberglass blanket and sheathed with a vinyl vapor barrier. The duct shall have an inside bending radius of not more than 3/4 of its I.D. It must comply with the latest N.F.P.A. Bulletin 90A and be listed as Class 1 air duct, U.L. Standard 181. Duct shall have published pressure ratings of not less than 12" W.G. positive pressure, 12" W.G. negative pressure.
- C. Ducts shall be supported with metal straps maximum 4'-0" O.C. Flex duct shall be securely bolted to diffuser duct branch with metal band clamps. Support all flexible duct runs per SMACNA standards.
- D. Maximum flexible duct runs shall be 8'-0".

2.3 VOLUME DAMPERS

- A. Duct system shall have sufficient volume dampers, whether or not shown, to control and adjust the total volume of each system, each zone, in each branch, and at each diffuser or grille. Volume dampers shall be of the butterfly type with 16 gauge galvanized iron blade. All dampers shall be

equipped with Duro-Dyne Type UNXLD locking quadrant, or an approved equal. Dampers 25" in width and longer shall be provided with damper bearings on each end of shaft. Bearings shall extend through ducts with the one opposite quadrant mounted on a 2" x 3" x 1/8" plate held to duct with sheet metal screws. Maximum width of single blades shall be 14".

2.4 AIR GRILLES AND REGISTERS AND DIFFUSERS:

- A. Grilles and registers shall be Price, Metal Aire, or equal by Carnes, equal to those listed on the drawings. See Drawings for sizes, CFM's, locations, and qualities of various types. In general, all units shall be installed with face bars parallel to floor or nearest wall. All volume control dampers shall be key operated. Finish for all diffusers, grilles, and registers to be factory finished with color selected by the Architect/Engineer.
- B. All grilles, and registers, shall be equal to model numbers as scheduled on Drawings.

2.5 EXHAUST FANS

- A. Ceiling Exhaust Fans (non-motion activated): Furnish and install low noise ceiling exhaust fans constructed with rust proof galvanized steel body, four-pole totally enclosed condenser motor rated for continuous use with thermal cut-off fuse, 4" duct with duct adaptor and built in low leakage factory backdraft damper. Provide factory wall cap with backdraft damper as shown on the drawings and in a color selected by owner. The Fan shall be U.L. and Energy Star Rated.
- B. All fan submittals shall be submitted to the Architect/ Engineer with fan operating curves and sound data. Fan selections shall be plotted on operating curves and sound levels shall be noted on sound data for each fan.

PART 3 - EXECUTION

3.1 SHEET METAL WORK

- A. Work shall be erected in a first-class and workmanlike manner, in accordance with the "Low and Medium Velocity Duct Standard", and "HVAC Duct Construction Standards", latest editions, published by the Sheet Metal and Air Conditioning Contractors' National Association, Inc. and as specified within these specifications. Where these specifications exceed these standards, the specifications shall be followed. All ducts, unless otherwise approved, shall be true to the dimensions indicated on the plans and shall be straight and smooth on the inside, with neatly finished joints.
- B. The ducts shall be securely anchored to the building construction in an approved manner, and shall be so installed as to be completely free from vibration under all conditions of operation. The Contractor shall furnish and erect all necessary supports and cross-framing required for ducts and equipment.
- C. All slip joints shall be made in direction of air flow. Branches to and from the main trunk shall be made at an angle approved by the Architect/Engineer, but shall in no case exceed 45 degrees to the line of air flow.

- D. All notches for connecting sections of duct and all grooving seam notches shall not be cut any deeper than necessary to insure tight corner. Any notched corners not meeting with the approval of the Architect/Engineer shall be removed and reinstalled or sealed with solder, subject to the approval of the Architect/Engineer.
- E. Where galvanized sheet metal ducts connect to bronze or copper louvers or other apparatus of dissimilar materials, the connections shall be fitted with neoprene gaskets.
- F. Elbows, where space permits, shall be fabricated with inside radius no less than the dimension of the duct in the plane of the elbow. Turning vanes shall be used where short radius or square elbows are used. Vanes in square elbows shall be spaced on 3" radius on the diagonal for ducts up to 24" wide, 6" radius for ducts 25" to 36" wide, and 7" radius for ducts 37" to 48" wide. All vanes in galvanized ducts shall be as specified and must be rigid so as not to rattle or vibrate in the air stream.
- G. This Contractor shall be responsible for the coordination of the sheet metal installation with the work of all other trades. Work shall be so installed that headroom is maximum possible and coordination with other trades in accomplishing this is mandatory.

3.2 HANGERS AND SUPPORTS

- A. Support drops from overhead main at top and bottom of drop and ends of horizontal runs and elsewhere as required with split clamps/protecting saddles anchored to structure to prevent sway.
- B. Duct Support: Galvanized steel angles securely fastened to duct and suspended from building structural framing.
- C. Equipment Supports: All equipment shall be firmly supported on, or suspended from, the building structure. Steel angles, fasteners, rods, and vibration eliminator units required to support the equipment without undue transmission of vibration through the building shall be furnished and installed by this Contractor.

3.3 CLEANING OUT THE AIR SYSTEM

- A. No fans shall be run for temporary heating, ventilating, testing, or otherwise. If systems are not properly closed-off during construction the engineer may require the systems to be professionally cleaned and tested.
- B. Upon completion of construction and before testing, the interior of all air handling units and plenums shall be vacuum cleaned to remove all construction dirt, dust, etc. before the units are turned on.

3.4 HVAC SYSTEM ADJUSTMENT

- A. The final adjustments and balancing of the air systems and the temperature control system shall be performed by an independent certified Balancing Contractor under the supervision of the Architect/Engineer. All labor and instruments necessary to complete this work shall be provided by the Balancing Contractor. The temperature control manufacturer shall provide labor and technical assistance as required by the Balancing Contractor.
- B. Prior to this final adjusting and balancing, this Contractor shall have thoroughly checked and tested all parts of the system for complete and proper piping connections, proper electrical connections,

- proper lubrication of all parts and equipment, proper direction of rotating for equipment, control all piping, and otherwise see that all systems are mechanically and electrically complete.
- C. Immediately following the completion of the adjusting and balancing of the systems, final readings shall be taken and recorded of all electrical loads for motors and heating equipment. After all data is recorded, a final functional test of all systems will be performed to verify their operation and demonstrate to the Owner the performance and operating procedures for the systems.
 - D. Defective Work: If inspection or tests indicate defects, such defective work or material shall be replaced or repaired as necessary and inspection and tests repeated. Repairs to piping shall be made with new materials. No caulking of screwed joints or holes will be acceptable.

END OF SECTION 23 3113

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 26 0010 – ELECTRICAL GENERAL PROVISIONS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. This Section specifies provisions for electrical work, including: certain adaptive expansions of requirements specified in Division 1, General Requirements for the electrical systems as a whole, and work to be performed as electrical work, because of its close association.
- B. Related Sections include the following:
 - 1. The general provisions of the Contract, including the General, Supplementary, and Special Conditions and the General Requirements apply to the work specified in all sections of this Division.

1.2 SUMMARY OF ELECTRICAL WORK

- A. The work required of this Division shall include all labor, materials, equipment, plant, transportation and all necessary and related items required to provide complete and satisfactory operating electrical systems for the project. The work in general consists of additions and alterations to the existing electrical systems, including but not limited to the following:
 - 1. Reuse of existing work.
 - 2. Electrical service entrance and coordination with the electric utility
 - 3. Power distribution system, feeders and equipment
 - 4. Branch circuits to all electrical equipment
 - 5. Lighting system, luminaires and accessories
 - 6. Lighting control systems
 - 7. Final connections to all electrical equipment furnished by this Division and by other Divisions.
 - 8. Grounding and bonding
 - 9. Wiring devices, raceways, boxes and fittings
 - 10. Fire alarm system
 - 11. Telecommunications horizontal wiring systems
 - 12. Temporary light and power for construction
 - 13. Receiving, handling and storage of all equipment required of this Division
 - 14. Mounting of equipment furnished by other trades, if so designated
 - 15. Commissioning of electrical systems and equipment
 - 16. The final testing and adjustment of all electrical systems and equipment to demonstrate proper function, control and interlock.
 - 17. All minor and related items and accessories to each make each system complete in all respects.
- B. Contract Drawings for Electrical Work are in part diagrammatic, intended to convey scope of work and indicate the general arrangement of equipment. Electrical trade shall follow these Drawings in laying out their work, consult General Construction Drawings to familiarize themselves with conditions affecting

their work, and shall verify spaces in which their work will be installed by measurements on the job. DO NOT SCALE DRAWINGS.

- C. Refer to the Division 26 Sections for the primary technical specifications of electrical work. Refer to the Division 27 and 28 sections for the primary technical specifications of communications and electronic safety systems work.
- D. Any discrepancy between any Drawings, Details and/or Specifications must be promptly submitted to the Architect for determination. Any adjustment by the Contractor without determination will be at the Contractor's own risk and expense.
- E. Each bidder shall carefully examine all of the Contract Documents and shall submit written requests for clarification of all discrepancies between, or meaning of the various parts of the documents in compliance with the bidding instructions. All clarifications will be issued by written addenda. Failure to request clarifications during bidding shall not entitle the Contractor to additional compensation for performing the work in accordance with the Contract Documents as interpreted by the Architect.

1.3 PERMITS AND CODES

- A. Unless specified otherwise this Contractor shall obtain and pay for all licenses and permits and shall pay for all fees and charges for the connection to outside services and for use of property other than the site of work for storage of materials and other purposes.

1. Electric utility costs shall be paid directly, by the Owner

- B. In addition to the requirements in Section 01 6000, all work shall comply with the latest edition, in effect at time of construction, of the following codes, rules, laws and regulations:

ADA	Americans with Disabilities Act
ANSI	American National Standards Institute
ASTM	American Society of Testing Materials
BOCA	Building Officials and Code Administration, including supplements
IEEE	Institute of Electrical and Electronic Engineers
IPCEA	Insulated Power Cable Engineers Association
NEMA	National Electrical Manufacturers Association
NEC	National Electrical Code (NFPA No. 70)
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Act
UL	Underwriters Laboratories

State and Local Laws and Regulations

- C. Obtain and pay for State of New Hampshire Certificate of Inspection and Approval.

1.4 WORK EXCLUDED, PROVIDED UNDER OTHER SECTIONS

- A. All general conditions work shall be coordinated and provided by the General Contractor unless specifically identified otherwise by the General Contractor. This work includes concrete, wood, metals, painting, penetrations and similar. Any questions shall be coordinated with the General Contractor during bidding.

- B. Excavation and Backfill: Refer to Division 31, Earthwork. Coordinate work of this section with excavation and backfill work.
- C. Concrete Work: Refer to Division 03, Concrete General. Coordinate work of this Section with concrete work. Provide size, layout, location and accessories for bases required for equipment as indicated on the Drawings.
- D. Equipment Backboard: Equipment backboards shall be provided under Division 06, Wood, Plastics and Composites in the Rough Carpentry section. Coordinate size required. Do not install electrical equipment on backboard until board has been painted. Paint shall be gray. Do not paint over fire resistance labeling.
- E. Finished Painting: All finished painting shall be provided under Division 09. Electrical contractor shall include the restoration of manufacturers finish paint damaged during shipment, installation or temporary use to original condition prior to finish painting.

1.5 WORK AND MATERIALS SPECIFIED ELSEWHERE

- A. Equipment, materials and work requiring electric service and specified in other Divisions include, but are not limited to:
 - 1. Pumps
 - 2. Air moving equipment
 - 3. Condensing Units
 - 4. Temperature control system
 - 5. Heating equipment
 - 6. Appliances
 - 7. Elevator

1.6 SPECIAL WIRING REQUIREMENTS

- A. In addition to the general requirements of compliance with the applicable Codes, Rules and Regulations of the Town of Littleton and the State of New Hampshire, the work requires special wiring methods including, but not limited to, the following:
 - 1. Emergency/Standby Power System: NFPA 110, NEC 700/701
 - 2. Elevator ANSI A17.1, NEC 620
 - 3. Raceway Seals: NEC 300
 - 4. Fire Alarm System NEC 760

1.7 TEMPORARY POWER AND LIGHT

- A. Coordinate work requirements of this section to provide a system of temporary power and light for the project and as follows:
 - 1. Provide, connect and terminate temporary power and light facilities as determined by the General Contractor at locations required during construction.
 - 2. Temporary lighting for all construction areas of the project including wiring, fixtures and controls.
 - 3. Temporary power outlets for the purpose of supplying connections for construction tools and machines, and temporary plumbing and heating equipment.

4. All equipment installation and wiring shall comply with applicable sections of this specification, provide overload protection, disconnect switches and devices as required with ground fault protection.
5. Do not subject temporary electrical facilities to higher demand or loading than designed for.
6. When no longer needed for construction work, remove electrical temporary facilities. Repair and restore work damaged by installation and operation of electrical temporary facilities. Clean and restore permanent electrical systems which have been used to provide temporary services, to the condition of new and unused work except for normal wear.
7. Electrical work installed as temporary facilities shall, upon removal, remain the property of the Installer.

1.8 COORDINATION OF ELECTRICAL INSTALLATION

- A. Sequence, coordinate and integrate the various elements of electrical work so that the electrical system will perform as indicated and be in harmony with the other work of the building. The Engineer will not supervise the coordination, which is the exclusive responsibility of the Contractor. Comply with the following requirements:
 1. Install conduit, cables wireways and similar services straight and true, aligned with other work, close walls and overhead structure, concealed where possible in occupied spaces, and out-of-way with maximum passageway and headroom remaining in each space.
 2. Except as otherwise indicated, arrange electrical services and overhead equipment with a minimum of 7'-0" headroom in storage spaces and 8'-6" headroom in other spaces. Keep services as high as possible where higher spaces occur.
 3. Arrange work to facilitate maintenance and repair or replacement of equipment. Locate services requiring maintenance on wiring devices and similar units in front of services requiring less maintenance. Connect equipment for ease of disconnecting, with minimum of interference with other work. Locate operating and control equipment and devices for easy access.
 4. Install access panels where electrical work requiring access is concealed by finishes and similar work.
 5. Integrate electrical work above ceilings, including lighting fixtures, with ceiling finish, suspension, ductwork, air diffusers and other work, so that required performance of each will be achieved.
 6. Give the right-of-way in confined-service spaces to piping which must slope for drainage, and to ductwork and similar services which are less conformable than electrical services.
- B. Conform with the shop drawings including the coordination drawings, to the greatest extent possible. Conform to the arrangement indicated by the Contract Documents, recognizing that portions of the work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, comply with the Engineer's decision on resolution of the conflict.
- C. Coordinate the electrical work with the mechanical work for proper service to each item of equipment requiring electrical connection. Determine, with each mechanical equipment installer, the proper sequencing and location for disconnect switches and similar points of interface between mechanical and electrical work. Do not block equipment access doors or other points of access with electrical work and provide adequate clearance for filter changes and other routine maintenance to be performed. Except as otherwise indicated, the final connections are electrical work.
- D. Adjust and coordinate the timing of electrical system start-ups with mechanical system start-ups so that demonstration and testing of specified performance can be observed and recorded. Exercise proper care in off season start-ups, to ensure that systems and equipment will not be damaged by the operation.

1.9 SUBMITTALS

- A. Prepare electrical shop drawings to accurate scale except where diagrammatic representations are specifically indicated. Show clearance dimensions of critical locations, and show dimensions of spaces required for operating and maintenance of equipment. Show conduit and conductor connections and other service connections, and show interfaces with other work including structural support.
- B. Where printed data covers more than one distinct product, size, type, material, trim, accessory group or other variation, mark submitted copy to indicate which of the variations is to be provided. Delete or mark-out portions which are not applicable. Where operating ranges are shown, mark data to show portion of range required for project application. For each product include the manufacturer's specifications, installation or fabrication instruction, sizes, weights, speeds, operating capacities, conduit and wire connection sizes and locations.
- C. Items to be submitted are as follows:
 - 1. Name, address, list of similar projects completed, qualifications, and at least three (3) references for the Electrical Subcontractor proposed to perform the electrical work.
 - 2. Catalog cuts and shop drawings of all materials and equipment, as listed herein.
 - 3. Installation instructions and Operation and Maintenance Manuals for all equipment.
 - 4. List of nameplate designations for Engineer's acceptance, prior to engraving.
 - 5. Copies of all required Permits.
 - 6. Duplicate copies of electrical inspection certificates.
 - 7. Complete listing of all tests performed and copies of the certified test results.
 - 8. "As-Built" wiring diagrams and circuit directories.
- D. Equipment Submittals: Refer to other sections of this division for required submittals as well as the plan notes for additional, specific product information required to be submitted for approval.

1.10 MATERIALS SUBSTITUTIONS

- A. Comply with the requirements of Division 01, General Requirements and requirements of Division 26 sections, as applicable.
- B. Substitute materials and equipment, where requested or proposed by Contractor, shall be itemized and shall show cost to Owner whether it be a "deduction" or "no change in cost" to the Base Bid Price. The contractor is to coordinate with all other trades on requirements of the substitution and shall bear all additional cost associated with the substitution. It shall be held that no change in Contract completion time will occur should Engineer elect to accept any alternates unless such time is specifically stated in the Contractor's Bid.
- C. In substitution of other makes for those items which are specified, only those requiring minor deviations in details from those specified will be considered, and any make which requires major changes in the design and structural elements of building will not be considered. In any event, the Engineer reserves the right to refuse to accept any substitute for the make specified.
- D. Uniformity, unless otherwise specified, equipment of materials of same type of classifications shall be used for same purpose and shall be the product of same manufacturer.
- E. Materials, equipment and products not approved shall not be used in construction.

1.11 ELECTRICAL WORK CLOSEOUT

A. Record Drawings:

1. Except where otherwise indicated, Electrical Drawings prepared by Engineer are diagrammatic in nature and may not show locations accurately for various components of electrical systems. Shop drawings (including coordination drawings) prepared by Contractor show certain portions of work more accurately to scale and location, and in greater detail. It is recognized that actual layout of installed work may vary from both Contract Drawings and shop drawings.
2. Maintain a white-print set (blue-line or black-line) of electrical contract drawings and shop drawings in clean, undamaged condition, for mark-up of actual installation which vary from the work as shown. Mark-up whatever drawings are most capable of showing installed conditions accurately. Where shop drawings are marked, record a reference note on appropriate contract drawings. In general, record every substantive installation of electrical work which previously is either not shown or shown inaccurately, but in any case, record the following:
 - a. Work concealed behind or within other work, in a non-accessible arrangement.
 - b. Panelboards and control devices located and numbered, and devices requiring maintenance located.
 - c. Sensor and signal locations of alarm systems and controls.
3. Maintain Record Drawings up to date in a timely fashion. Record drawing mark-ups may be reviewed monthly by the Architect/Owner prior to authorizing payment of the requisition.

B. Test, Adjustments, Cleaning and Lubrication:

1. Provide system performance test runs. Coordinate test runs of electrical systems with test runs of equipment served thereby (heating, air conditioning, plumbing, etc.). Check each item in each system to determine that it is set for proper operation. With Owner's Representative and Engineer present, operate each system in a test run of appropriate duration to demonstrate compliance with performance requirements. During or following test runs, make final corrections or adjustments of systems to refine and improve performances where possible, including noise and vibration reductions, elimination of hazards, better response of controls, signals and alarms, and similar system performance improvements. Provide testing or inspection devices as may be reasonably requested for Engineer's observation of actual system performances. Demonstrate that controls and items requiring service or maintenance are accessible.
2. After final performance test run of each electrical system, clean system both externally and internally. Comply with manufacturer's instructions for lubrication of both power and hand operated equipment, and remove excess lubrication. Touch-up minor damage to factory painted.

1.12 DEFINITIONS

- A. Except as specifically defined otherwise, the following definitions supplement definitions of the Contract, General Conditions and Supplementary Conditions and apply generally to the Work.
- B. Indicated: Shown on Drawings by notes, graphics or schedules, or written into other portions of Contract Documents. Terms such as "shown", "noted", "scheduled" and "specified" have same meaning as "indicated", and are used to assist the reader in locating particular information.

- C. Project Site: Space available to Contractor at location of project, either exclusively or to be shared with separate contractors, for performance of the Work.
- D. Furnish: Supply and deliver to project site, ready for unloading, unpacking, assembly, installation and similar subsequent requirements.
- E. Install: Operations at project site, including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar requirements.
- F. Provide: Furnish and install, complete and ready for intended use.
- G. Installer: Entity (firm or person) engaged to install work, by Contractor, Subcontractor or Sub-subcontractor.

1.13 MEANS AND METHODS

- A. Unless otherwise expressly provided in the Contract Documents the means and methods of construction, including all safety procedures, shall be such as the Contractor may choose, subject however, to the Engineer's right to reject means and methods proposed by the Contractor which: (1) will constitute or create a hazard to the work, person(s) or property or (2) will not produce finished work in accordance with the terms of the Contract. The right to reject shall not, in any way, be construed or interpreted as acceptance or control of means and methods by the Engineer and/or his representative.
- B. The Engineer's rejection of the Contractor's means and methods of construction, or the Engineer's failure to exercise his right to reject such means or methods, shall not relieve the Contractor of his obligation to accomplish the result intended by the Contract: nor shall the retention of such right-to-reject create a cause of action for damages due to exercise, or failure to exercise, such rights.

1.14 GUARANTEE, SERVICE AND REPLACEMENT

- A. Except as a longer period may be provided in this specification, this Contractor shall guarantee the work to the full extent of the provision of the Drawings, this specification and the General Conditions for a period of one (1) year from the date of acceptance by the Architect as evidenced by the Architect's Final Certificate.
- B. This Contractor shall service all installed equipment free of charge during the guarantee period.
- C. Any apparatus or equipment that requires excessive service during the guarantee period shall be considered defective and shall be replaced by this Contractor without additional cost to Owner.

1.15 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. All materials shall be delivered to the site and stored in factory fabricated containers.
- B. All materials shall be stored in interior spaces protected from weather, dirt and construction traffic, except the materials that are not affected by exposure to the weather may be stored outside if elevated above grade and enclosed in a durable, waterproof wrapping.

- C. Handle all materials carefully to avoid damage to equipment or finish. Do not install damaged equipment, remove from site.
- D. Each Contractor or his representative shall visit the site prior to bidding and make an estimate of facilities and difficulties attending execution of their work. No claims will be allowed because of discrepancies in such estimates.

1.16 INSTALLATION – GENERAL

- A. All applicable equipment shall be U.L. Listed and shall be installed in accordance with U.L., NEMA, NFPA, NEC and IPCEA Standards.
- B. All equipment shall be installed plumb, both vertically and horizontally, presenting a neat finished appearance.
- C. All equipment, boxes, cables and raceways shall be securely fastened to building structure in accordance with NEC requirements.
- D. All panelboards and group mounted equipment (starters, disconnect switches, etc.) to be surface mounted shall be installed on plywood backboards. Backboards shall be painted before installation of equipment.
- E. Install equipment in accordance with manufacturers written instructions, at locations indicated, fully coordinated with work and equipment to be installed by others.
- F. Location of outlets shall be generally as shown on the Drawings. Field coordinate with requirements of ceilings, furniture and equipment. Locate switches on strike side of doors and locate device outlets centered on masonry block or other regular or patterned building finishes. Make minor adjustments to outlet locations as directed, prior to rough-in, at no extra cost.

1.17 QUALITY ASSURANCE – GENERAL

- A. Manufacturers shall be firms regularly engaged in the manufacture of electrical products of the types and ratings required, whose products have been in satisfactory use in similar service for not less than three (3) years.
- B. Installer shall be a firm with at least three (3) years of successful installation experience on projects with electrical installation work similar to that required for the project.
- C. Comply with National Electrical Code (NFPA 70) as applicable to construction and installation of electrical systems.
- D. Provide electrical equipment which has been listed and labeled by Underwriter's Laboratories, where applicable.
- E. Comply with National Electrical Manufacturers Association Standards publications pertaining to materials, construction and testing, where applicable.

1.18 ALTERNATES

- A. There are no alternates that affect electrical work.

1.19 ALLOWANCES

- A. Carry a \$10,000 allowance to inspect and replace all ungrounded wiring in the building that may exist. Perform inspection and provide report regarding extent, quantity of circuits and wiring along with cost estimate to perform the wiring replacement for approval, prior to beginning work.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 RENOVATION AND DEMOLITION WORK, AS APPLICABLE

- A. Refer to contract Drawings and notes for information specific to renovation and/or demolition.
- B. The Contractor shall remove all wiring devices, luminaires etc., which are indicated to be removed or in areas where new devices are shown. Devices, which are to be removed, may require reworking conduit and wiring in order to maintain service to other devices. If removed devices are flush or semi-flush in walls or ceilings that are to remain, blank coverplates are to be installed on outlet boxes. Where renovation interferes with circuits in areas, which are otherwise undisturbed, circuits shall be reworked as required. Existing devices and circuiting, which are shown, are indicated only for informational purposes. The Contractor shall visit the site and shall verify conditions as they exist and shall remove, relocate and/or rework any electrical equipment or circuits affected (whether indicated or not) due to the removal or reworking of existing walls, ceilings, etc. The Contractor shall familiarize himself with all work to be done by other trades by studying the Architectural, Structural, Mechanical and Plumbing Drawings. Coordinate the routing of all conduits with the Mechanical and Plumbing Contractors in order to avoid conflicts with ducts, pipes, etc.
- C. All equipment, fixtures, devices, etc., which are removed and designated as salvageable by the Owner, shall be delivered to the Owner for disposition. All items that are not reused shall become the property of the Contractor and shall be removed from the site.
- D. Existing Conduits, Pipes, Equipment, etc.:
 - 1. Refer to Division 1 for additional requirements. Existing conduits, pipes, utility lines, tanks, equipment or other obstructions, whether underground, concealed or exposed, are not generally indicated on the Drawings.
 - 2. Locate such obstructions prior to the start of the work and plan the work so as to route and locate all new work to avoid these obstructions.
 - 3. Repair or replace, at no cost to the Owner, the existing installations where damaged during the course of construction.
- E. All existing electrical equipment, such as luminaires, boxes, enclosures, switchboards, motor control centers, and panelboards, which are to be worked on or relocated under this Contract shall be cleaned and labeled to meet these Specifications.

1. Switchboards and Motor Control Centers: Provide new nameplates and warning signs.
 2. Panelboards: Provide new nameplates, signs and directories.
- F. The Electrical Contractor shall be responsible for any temporary power wiring or electrical equipment arrangements to be made for the mechanical, plumbing or Owner's equipment that needs to be maintained on line during the construction phase.
- G. Electrical Outages: Electrical outages must be held to a minimum. The Contractor shall obtain written authorization from the General Contractor 7 calendar days prior to all outages. The General Contractor may direct the Contractor as to the time of day or night and the date an outage may take place. All outages will be held only during non-production hours, i.e., premium time. This Contractor shall carry this premium time accordingly.

END OF SECTION 26 0010

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This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 26 0519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Building wires and cables rated 600 V and less.
 - 2. Connectors, splices, and terminations rated 600 V and less.
- B. Related Requirements:
 - 1. Section 26 0523 "Control-Voltage Electrical Power Cables" for control systems communications cables and Classes 1, 2 and 3 control cables.
 - 2. Section 27 1500 "Communications Horizontal Cabling" for cabling used for voice and data circuits.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

- A. Aluminum and Copper Conductors: Comply with NEMA WC 70/ICEA S-95-658.
- B. Conductor Insulation: Comply with NEMA WC 70/ICEA S-95-658 for Type THHN-2-THWN-2, Type XHHW-2 and Type SO.
- C. Multi-conductor Cable: Comply with NEMA WC 70/ICEA S-95-658 for metal-clad cable, Type MC, with ground wire.

2.2 CONNECTORS AND SPLICES

- A. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

2.3 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NFPA 70.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders: Copper or aluminum. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger, except VFC cable, which shall be extra flexible stranded.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Service Entrance: Type XHHW-2, single conductors in raceway.
- B. Feeders: Type XHHW-2, single conductors in raceway, or Metal-clad cable, Type MC.
- C. Branch Circuits: Type THHN-2-THWN-2, single conductors in raceway, or Metal-clad cable, Type MC.
- D. Cord Drops and Portable Appliance Connections: Type SO, hard service cord with stainless-steel, wire-mesh, strain relief device at terminations to suit application.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.
- B. Complete raceway installation between conductor and cable termination points according to Section 26 0533 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.
- C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
- F. Support cables according to Section 26 0529 "Hangers and Supports for Electrical Systems."

3.4 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.
- B. Make splices, terminations, and taps that are compatible with conductor material.
 - 1. Use oxide inhibitor in each splice, termination, and tap for aluminum conductors.
- C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches (150 mm) of slack.

3.5 IDENTIFICATION

- A. Identify and color-code conductors and cables according to Section 26 0553 "Identification for Electrical Systems."
- B. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

3.6 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 26 0544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.7 FIRESTOPPING

- A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly.

3.8 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors for compliance with requirements.
 - 2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
- B. Test and Inspection Reports: Prepare a written report to record the following:
 - 1. Procedures used.
 - 2. Results that comply with requirements.
 - 3. Results that do not comply with requirements and corrective action taken to achieve compliance with requirements.
- C. Cables will be considered defective if they do not pass tests and inspections.

END OF SECTION 26 0519

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 26 0523 - CONTROL-VOLTAGE ELECTRICAL POWER CABLES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Low-voltage control cabling.
 - 2. Control-circuit conductors.
 - 3. Identification products.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 PERFORMANCE REQUIREMENTS

- A. Flame Travel and Smoke Density in Plenums: As determined by testing identical products according to NFPA 262 by a qualified testing agency. Identify products for installation in plenums with appropriate markings of applicable testing agency.
 - 1. Flame Travel Distance: 60 inches (1520 mm) or less.
 - 2. Peak Optical Smoke Density: 0.5 or less.
 - 3. Average Optical Smoke Density: 0.15 or less.
- B. Flame Travel and Smoke Density for Riser Cables in Non-Plenum Building Spaces: As determined by testing identical products according to UL 1666.
- C. Flame Travel and Smoke Density for Cables in Non-Riser Applications and Non-Plenum Building Spaces: As determined by testing identical products according to UL 1685.

2.3 BACKBOARDS

- A. Description: Plywood, fire-retardant treated, 3/4 by 48 by 96 inches (19 by 1220 by 2440 mm).

- B. Painting: Paint plywood on all sides and edges with eggshell grey latex paint.

2.4 LOW-VOLTAGE CONTROL CABLE

- A. Plenum-Rated, Paired Cable: NFPA 70, Type CMP.
 - 1. One or Multi-pair, twisted, No. 16 AWG, stranded (19x29) tinned-copper conductors.
 - 2. PVC insulation.
 - 3. Unshielded.
 - 4. PVC jacket.
 - 5. Flame Resistance: Comply with NFPA 262.

2.5 CONTROL-CIRCUIT CONDUCTORS

- A. Class 1 Control Circuits: Stranded copper, Type THHN-2-THWN-2, in raceway, complying with UL 44.
- B. Class 2 Control Circuits: Stranded copper, Type THHN-2-THWN-2, in raceway, complying with UL 44.
- C. Class 3 Remote-Control and Signal Circuits: Stranded copper, Type THHN-2-THWN-2, in raceway, complying with UL 44.

PART 3 - EXECUTION

3.1 INSTALLATION OF RACEWAYS AND BOXES

- A. Comply with requirements in Section 26 0533 "Raceways and Boxes for Electrical Systems" for raceway selection and installation requirements for boxes, conduits, and wireways as supplemented or modified in this Section.
 - 1. Outlet boxes shall be no smaller than 2 inches (50 mm) wide, 3 inches (75 mm) high, and 2-1/2 inches (64 mm) deep.
 - 2. Flexible metal conduit shall not be used.
- B. Comply with TIA-569-B for pull-box sizing and length of conduit and number of bends between pull points.
- C. Install manufactured conduit sweeps and long-radius elbows if possible.
- D. Raceway Installation in Equipment Rooms:
 - 1. Position conduit ends adjacent to a corner on backboard if a single piece of plywood is installed, or in the corner of the room if multiple sheets of plywood are installed around perimeter walls of the room.
 - 2. Install cable trays to route cables if conduits cannot be located in these positions.
 - 3. Secure conduits to backboard if entering the room from overhead.
 - 4. Extend conduits 3 inches (75 mm) above finished floor.
 - 5. Install metal conduits with grounding bushings and connect with grounding conductor to grounding system.

- E. Backboards: Install backboards with 96-inch (2440-mm) dimension vertical. Butt adjacent sheets tightly and form smooth gap-free corners and joints.

3.2 INSTALLATION OF CONDUCTORS AND CABLES

- A. Comply with NECA 1 and NFPA 70.
- B. General Requirements for Cabling:
 - 1. Comply with TIA-568-C Series of standards.
 - 2. Comply with BICSI ITSIMM, Ch. 5, "Copper Structured Cabling Systems".
 - 3. Terminate all conductors; no cable shall contain un-terminated elements. Make terminations only at indicated outlets, terminals, and patch panels.
 - 4. Cables may not be spliced.
 - 5. Secure and support cables at intervals not exceeding 30 inches (760 mm) and not more than 6 inches (150 mm) from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
 - 6. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI ITSIMM, Ch. 5, "Copper Structured Cabling Systems". Install lacing bars and distribution spools.
 - 7. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.
 - 8. Cold-Weather Installation: Bring cable to room temperature before de-reeling. Do not use heat lamps for heating.
 - 9. Pulling Cable: Comply with BICSI ITSIMM, Ch. 5, "Copper Structured Cabling Systems". Monitor cable pull tensions.
 - 10. Support: Do not allow cables to lie on removable ceiling tiles.
 - 11. Secure: Fasten securely in place with hardware specifically designed and installed so as to not damage cables.
- C. Open-Cable Installation:
 - 1. Install cabling with horizontal and vertical cable guides in telecommunications spaces with terminating hardware and interconnection equipment.
 - 2. Suspend copper cable not in a wireway or pathway a minimum of 8 inches (200 mm) above ceilings by cable supports not more than 30 inches (760 mm) apart.
 - 3. Cable shall not be run through or on structural members or in contact with pipes, ducts, or other potentially damaging items. Do not run cables between structural members and corrugated panels.
- D. Separation from EMI Sources:
 - 1. Comply with BICSI TDMM and TIA-569-B recommendations for separating unshielded copper voice and data communications cable from potential EMI sources including electrical power lines and equipment.

3.3 REMOVAL OF CONDUCTORS AND CABLES

- A. Remove abandoned conductors and cables. Abandoned conductors and cables are those installed that are not terminated at equipment and are not identified for future use with a tag.

3.4 CONTROL-CIRCUIT CONDUCTORS

- A. Minimum Conductor Sizes:
 - 1. Class 1 remote-control and signal circuits; No 14 AWG.
 - 2. Class 2 low-energy, remote-control, and signal circuits; No. 16 AWG.
 - 3. Class 3 low-energy, remote-control, alarm, and signal circuits; No 12 AWG.

3.5 FIRESTOPPING

- A. Comply with TIA-569-B, Annex A, "Firestopping."
- B. Comply with BICSI TDMM, "Firestopping" Chapter.

3.6 GROUNDING

- A. For data communication wiring, comply with ANSI-J-STD-607-A and with BICSI TDMM, "Bonding and Grounding (Earthing)" Chapter.
- B. For low-voltage control wiring and cabling, comply with requirements in Section 26 0526 "Grounding and Bonding for Electrical Systems."

3.7 IDENTIFICATION

- A. Comply with requirements for identification specified in Section 26 0553 "Identification for Electrical Systems."
- B. Identify data and communications system components, wiring, and cabling according to TIA-606-A; label printers shall use label stocks, laminating adhesives, and inks complying with UL 969.

3.8 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.

END OF SECTION 26 0523

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 26 0526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes grounding and bonding systems and equipment.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Burndy; Part of Hubbell Electrical Systems.
 - 2. Dossert; AFL Telecommunications LLC.
 - 3. ERICO International Corporation.
 - 4. Fushi Copperweld Inc.
 - 5. Galvan Industries, Inc.; Electrical Products Division, LLC.
 - 6. Harger Lightning and Grounding.
 - 7. ILSCO.
 - 8. O-Z/Gedney; A Brand of the EGS Electrical Group.
 - 9. Robbins Lightning, Inc.
 - 10. Siemens Power Transmission & Distribution, Inc.

2.2 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

2.3 CONDUCTORS

- A. Insulated Conductors: Copper or tinned-copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.

B. Bare Copper Conductors:

1. Solid Conductors: ASTM B 3.
2. Stranded Conductors: ASTM B 8.
3. Tinned Conductors: ASTM B 33.
4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch (6 mm) in diameter.
5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
6. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.
7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.

2.4 CONNECTORS

- A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.
- B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy.
- C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.
- D. Bus-Bar Connectors: Mechanical type, cast silicon bronze, solderless compression-type wire terminals, and long-barrel, two-bolt connection to ground bus bar.

2.5 GROUNDING ELECTRODES

- A. Ground Rods: Copper-clad steel: 3/4 inch by 10 feet (19 mm by 3 m).

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.
- B. Underground Grounding Conductors: Install bare tinned-copper conductor, No. 2/0 AWG minimum.
 1. Bury at least 24 inches (600 mm) below grade.
- C. Conductor Terminations and Connections:
 1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
 2. Underground Connections: Welded connectors except at test wells and as otherwise indicated.
 3. Connections to Structural Steel: Welded connectors.

3.2 GROUNDING AT THE SERVICE

- A. Equipment grounding conductors and grounding electrode conductors shall be connected to the ground bus. Install a main bonding jumper between the neutral and ground buses.

3.3 GROUNDING UNDERGROUND DISTRIBUTION SYSTEM COMPONENTS

- A. Comply with IEEE C2 grounding requirements.
- B. Pad-Mounted Transformers and Switches: Provide ground loop with connections to transformer as per utility standards.

3.4 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with all feeders and branch circuits.
- B. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:
 - 1. Feeders and branch circuits.
 - 2. Lighting circuits.
 - 3. Receptacle circuits.
 - 4. Single-phase motor and appliance branch circuits.
 - 5. Three-phase motor and appliance branch circuits.
 - 6. Flexible raceway runs.
 - 7. Metal-clad cable runs.

3.5 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Ground Rods: Drive rods until tops are 2 inches (50 mm) below finished floor or final grade unless otherwise indicated.
 - 1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.
 - 2. For grounding electrode system, install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.
- C. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.
 - 1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
 - 2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.

3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.

D. Grounding and Bonding for Piping:

1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes; use a bolted clamp connector or bolt a lug-type connector to a pipe flange by using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.

3.6 FIELD QUALITY CONTROL

- A. Perform tests and inspections. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.

END OF SECTION 26 0526

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 26 0529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Hangers and supports for electrical equipment and systems.

1.2 PERFORMANCE REQUIREMENTS

- A. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.
- B. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
- C. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor of five times the applied force.

1.3 ACTION SUBMITTALS

- A. Product Data: For steel slotted support systems.

1.4 QUALITY ASSURANCE

- A. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Allied Tube & Conduit.
 - b. Cooper B-Line, Inc.

- c. ERICO International Corporation.
 - d. GS Metals Corp.
 - e. Thomas & Betts Corporation.
 - f. Unistrut; Atkore International.
 - g. Wesanco, Inc.
 - 2. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
 - 3. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
 - 4. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
 - 5. Channel Dimensions: Selected for applicable load criteria.
- B. Raceway and Cable Supports: As described in NECA 1 and NECA 101.
- C. Conduit and Cable Support Devices: Steel and malleable-iron hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- D. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.
- E. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
- F. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
- 1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
 - a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) Hilti, Inc.
 - 2) ITW Ramset/Red Head; Illinois Tool Works, Inc.
 - 3) MKT Fastening, LLC.
 - 4) Simpson Strong-Tie Co., Inc.
 - 2. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.
 - a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) Cooper B-Line, Inc.
 - 2) Empire Tool and Manufacturing Co., Inc.
 - 3) Hilti, Inc.

- 4) ITW Ramset/Red Head; Illinois Tool Works, Inc.
- 5) MKT Fastening, LLC.
- 3. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.
- 4. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
- 5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
- 6. Toggle Bolts: All-steel springhead type.
- 7. Hanger Rods: Threaded steel.

2.2 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

- A. Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.
- B. Materials: Comply with requirements in Section 055000 "Metal Fabrications" for steel shapes and plates.

PART 3 - EXECUTION

3.1 APPLICATION

- A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.
- B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT as required by NFPA 70. Minimum rod size shall be 1/4 inch (6 mm) in diameter.
- C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted or other support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
 - 1. Secure raceways and cables to these supports with single-bolt conduit clamps or single-bolt conduit clamps using spring friction action for retention in support channel.
- D. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch (38-mm) and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.

3.2 SUPPORT INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.
- B. Raceway Support Methods: In addition to methods described in NECA 1, EMT may be supported by openings through structure members, as permitted in NFPA 70.

- C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb (90 kg).
- D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
 - 1. To Wood: Fasten with lag screws or through bolts.
 - 2. To New Concrete: Bolt to concrete inserts.
 - 3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
 - 4. To Existing Concrete: Expansion anchor fasteners.
 - 5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches (100 mm) thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches (100 mm) thick.
 - 6. To Steel: Beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69 or Spring-tension clamps.
 - 7. To Light Steel: Sheet metal screws.
 - 8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate.
- E. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

- A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- B. Field Welding: Comply with AWS D1.1/D1.1M.

3.4 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 - 1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils (0.05 mm).
- B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 26 0529

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 26 0533 - RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Metal conduits, tubing, and fittings.
 - 2. Nonmetal conduits, tubing, and fittings.
 - 3. Metal wireways and auxiliary gutters.
 - 4. Nonmetal wireways and auxiliary gutters.
 - 5. Boxes, enclosures, and cabinets.
 - 6. Handholes and boxes for exterior underground cabling.
 - 7. Two-part raceway sealants.

1.2 ACTION SUBMITTALS

- A. Product Data: For two-part raceway sealants, surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.

PART 2 - PRODUCTS

2.1 METAL CONDUITS, TUBING, AND FITTINGS

- A. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. GRC: Comply with ANSI C80.1 and UL 6.
- C. EMT: Comply with ANSI C80.3 and UL 797.
- D. FMC: Comply with UL 1; aluminum.
- E. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.
- F. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.
 - 1. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 886 and NFPA 70.
 - 2. Fittings for EMT: Provide setscrew type, steel fittings for EMT, unless noted otherwise on the Electrical Construction Drawings.
 - 3. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.
 - 4. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch (1 mm), with overlapping sleeves protecting threaded joints.

- G. Joint Compound for GRC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.2 NONMETALLIC CONDUITS, TUBING, AND FITTINGS

- A. Listing and Labeling: Nonmetallic conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.
- C. Fittings for RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.
- D. Solvent cements and adhesive primers shall have a VOC content of 510 and 550 g/L or less, respectively, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- E. Solvent cements and adhesive primers 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."

2.3 METAL WIREWAYS AND AUXILIARY GUTTERS

- A. Description: Sheet metal, complying with UL 870 and NEMA 250, Type 1, Type 3R or Type 4 unless otherwise indicated, and sized according to NFPA 70.
 - 1. Metal wireways installed outdoors shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Fittings and Accessories: Include covers, couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.

2.4 NONMETALLIC WIREWAYS AND AUXILIARY GUTTERS

- A. Listing and Labeling: Nonmetallic wireways and auxiliary gutters shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Description: Fiberglass polyester, extruded and fabricated to required size and shape, without holes or knockouts. Cover shall be gasketed with oil-resistant gasket material and fastened with captive screws treated for corrosion resistance. Connections shall be flanged and have stainless-steel screws and oil-resistant gaskets.
- C. Description: PVC, extruded and fabricated to required size and shape, and having snap-on cover, mechanically coupled connections, and plastic fasteners.
- D. Fittings and Accessories: Couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings shall match and mate with wireways as required for complete system.

- E. Solvent cements and adhesive primers shall have a VOC content of 510 and 550 g/L or less, respectively, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- F. Solvent cements and adhesive primers 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."

2.5 BOXES, ENCLOSURES, AND CABINETS

- A. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.
- B. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.
- C. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, aluminum, Type FD, with gasketed cover.
- D. Provide air tight vapor sealed boxes at all exterior walls and ceilings, below attic spaces and adjacent to unconditioned spaces.
- E. Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing 50 lb (23 kg). Outlet boxes designed for attachment of luminaires weighing more than 50 lb (23 kg) shall be listed and marked for the maximum allowable weight.
- F. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- G. Box extensions used to accommodate new building finishes shall be of same material as recessed box.
- H. Device Box Dimensions: 4 inches by 2-1/8 inches by 2-1/8 inches deep (100 mm by 60 mm by 60 mm deep).
- I. Gangable boxes are allowed.

2.6 TWO-PART RACEWAY SEALANTS

- A. Description: Two part, high-expansion foam duct sealant.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide the product listed below or comparable product:
 - a. American Polywater Corporation – FST Foam Sealant
 - 2. Sealant: Two-part, urethane foam consisting of a resin and curing agent mixed within a caulking tube in a 1/1 ratio.
 - 3. Performance:
 - a. Meets National Electrical Code Articles 225.27, 230.8, and 300.5(G) "Raceway Seals"
 - b. Will hold 20' water-head pressure continuously; 70' water-head pressure intermittently
 - c. Expands, cures and seals even with the presence of water
 - d. Seal will tolerate cable movement
 - e. Re-enterable; sealing shall be removable
 - 4. Sealant system shall be UL recognized, passing UL 94 Class HBF fire retardant rating.

5. -20°F to 200°F continuous operating range; -40°F to 250°F peak
6. Sealant performance shall not be affected by sunlight exposure

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

- A. Apply raceway products as outlined in the General Notes on the Electrical Construction Drawings.
- B. Minimum Raceway Size: 1/2-inch (16-mm) trade size.
- C. Raceway Fittings: Compatible with raceways and suitable for use and location.
 1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
 2. EMT: Use setscrew, steel fittings, unless otherwise noted on the Electrical Construction Drawings. Comply with NEMA FB 2.10.
 3. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.
- D. Do not install aluminum conduits, boxes, or fittings in contact with concrete or earth.
- E. Install surface raceways only where indicated on Drawings.
- F. Do not install nonmetallic conduit where ambient temperature exceeds 120 deg F (49 deg C).

3.2 INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.
- B. Keep raceways at least 6 inches (150 mm) away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- C. Comply with requirements in Section 26 0529 "Hangers and Supports for Electrical Systems" for hangers and supports.
- D. Arrange stub-ups so curved portions of bends are not visible above finished slab.
- E. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches (300 mm) of changes in direction.
- F. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.
- G. Support conduit within 12 inches (300 mm) of enclosures to which attached.
- H. Stub-ups to Above Recessed Ceilings:

1. Use EMT or RMC for raceways.
 2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.
- I. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.
- J. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.
- K. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch (35-mm) trade size and insulated throat metal bushings on 1-1/2-inch (41-mm) trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.
- L. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb (90-kg) tensile strength. Leave at least 12 inches (300 mm) of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.
- M. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces.
- N. Seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:
1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
 2. Where an underground service raceway enters a building or structure.
 3. Where otherwise required by NFPA 70.
- O. Where raceways enter the building from underground, utilize a two-part raceway sealant. Sealant shall be installed in conduits upon completion of the installation of conductors in the raceway. Spare conduits shall be sealed upon installation.
- P. Expansion-Joint Fittings:
1. Install in each run of aboveground RNC that is located where environmental temperature change may exceed 30 deg F (17 deg C) and that has straight-run length that exceeds 25 feet (7.6 m).
 2. Install type and quantity of fittings that accommodate temperature change listed for each of the following locations:
 - a. Outdoor Locations Not Exposed to Direct Sunlight: 125 deg F (70 deg C) temperature change.
 - b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F (86 deg C) temperature change.
 - c. Indoor Spaces Connected with Outdoors without Physical Separation: 125 deg F (70 deg C) temperature change.
 - d. Attics: 135 deg F (75 deg C) temperature change.
 3. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per degree F (0.06 mm per meter of length of straight run per degree C) of temperature change for PVC conduits.

4. Install expansion fittings at all locations where conduits cross building or structure expansion joints.
 5. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.
- Q. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches (1830 mm) of flexible conduit for recessed and semi-recessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
1. Use LFMC in damp or wet locations subject to severe physical damage.
 2. Use LFMC or LFNC in damp or wet locations not subject to severe physical damage.
- R. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.
- S. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.
- T. Locate boxes so that cover or plate will not span different building finishes.
- U. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.
- V. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

3.3 **INSTALLATION OF UNDERGROUND CONDUIT**

- A. Direct-Buried Conduit:
1. Excavate trench bottom to provide firm and uniform support for conduit.
 2. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches (300 mm) of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction as specified in Division 31 "Earth Moving."
 3. Install manufactured duct elbows for stub-up at poles and equipment and at building entrances through floor unless otherwise indicated. Encase elbows for stub-up ducts throughout length of elbow.
 4. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through floor.
 - a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches (75 mm) of concrete for a minimum of 12 inches (300 mm) on each side of the coupling.
 - b. For stub-ups at equipment mounted on outdoor concrete bases and where conduits penetrate building foundations, extend steel conduit horizontally a minimum of 60 inches (1500 mm) from edge of foundation or equipment base. Install insulated grounding bushings on terminations at equipment.

5. Underground Warning Tape: Comply with requirements in Section 26 0553 "Identification for Electrical Systems."

3.4 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 26 0544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.5 FIRESTOPPING

- A. Install firestopping at penetrations of fire-rated floor and wall assemblies. Comply with requirements in Division 07 "Penetration Firestopping."

3.6 PROTECTION

- A. Protect coatings, finishes, and cabinets from damage and deterioration.
 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
 2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION 26 0533

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SECTION 26 0544 - SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Sleeves for raceway and cable penetration of non-fire-rated construction walls and floors.
 - 2. Sleeve-seal systems.
 - 3. Sleeve-seal fittings.
 - 4. Grout.
 - 5. Silicone sealants.
 - 6. Two-part duct sealants.
- B. Related Requirements:
 - 1. Division 07 "Penetration Firestopping" for penetration firestopping installed in fire-resistance-rated walls, horizontal assemblies, and smoke barriers, with and without penetrating items.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 SLEEVES

- A. Wall Sleeves:
 - 1. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, plain ends.
 - 2. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.
- B. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies: Galvanized-steel sheet; 0.0239-inch (0.6-mm) minimum thickness; round tube closed with welded longitudinal joint, with tabs for screw-fastening the sleeve to the board.
- C. Sleeves for Rectangular Openings:
 - 1. Material: Galvanized sheet steel.
 - 2. Minimum Metal Thickness:
 - a. For sleeve cross-section rectangle perimeter less than 50 inches (1270 mm) and with no side larger than 16 inches (400 mm), thickness shall be 0.052 inch (1.3 mm).

- b. For sleeve cross-section rectangle perimeter 50 inches (1270 mm) or more and one or more sides larger than 16 inches (400 mm), thickness shall be 0.138 inch (3.5 mm).

2.2 SLEEVE-SEAL SYSTEMS

- A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Advance Products & Systems, Inc.
 - b. CALPICO, Inc.
 - c. Metraflex Company (The).
 - d. Pipeline Seal and Insulator, Inc.
 - e. Proco Products, Inc.
 - 2. Sealing Elements: EPDM rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
 - 3. Pressure Plates: Carbon steel.
 - 4. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating, of length required to secure pressure plates to sealing elements.

2.3 SLEEVE-SEAL FITTINGS

- A. Description: Manufactured plastic, sleeve-type, waterstop assembly made for embedding in concrete slab or wall. Unit shall have plastic or rubber waterstop collar with center opening to match piping OD.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Presealed Systems.

2.4 GROUT

- A. Description: Nonshrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.
- B. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- C. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

2.5 SILICONE SEALANTS

- A. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below.
 - 1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces that are not fire rated.
 - 2. Sealant shall have VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 3. Sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- B. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

PART 3 - EXECUTION

3.1 SLEEVE INSTALLATION FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS

- A. Comply with NECA 1.
- B. Comply with NEMA VE 2 for cable tray and cable penetrations.
- C. Sleeves for Conduits Penetrating Above-Grade Non-Fire-Rated Concrete and Masonry-Unit Floors and Walls:
 - 1. Interior Penetrations of Non-Fire-Rated Walls and Floors:
 - a. Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Division 07 "Joint Sealants."
 - b. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect material while curing.
 - 2. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
 - 3. Size pipe sleeves to provide 1/4-inch (6.4-mm) annular clear space between sleeve and raceway or cable unless sleeve seal is to be installed.
 - 4. Install sleeves for wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.
 - 5. Install sleeves for floor penetrations. Extend sleeves installed in floors 2 inches (50 mm) above finished floor level. Install sleeves during erection of floors.
- D. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.

- E. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.
- F. Underground, Exterior-Wall and Floor Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch (25-mm) annular clear space between raceway or cable and sleeve for installing sleeve-seal system.

3.2 SLEEVE-SEAL-SYSTEM INSTALLATION

- A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at raceway entries into building.
- B. Install type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.3 SLEEVE-SEAL-FITTING INSTALLATION

- A. Install sleeve-seal fittings in new walls and slabs as they are constructed.
- B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.
- C. Secure nailing flanges to concrete forms.
- D. Using grout, seal the space around outside of sleeve-seal fittings.

END OF SECTION 26 0544

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 26 0553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Identification for conductors.
 - 2. Underground-line warning tape.
 - 3. Warning labels and signs.
 - 4. Instruction signs.
 - 5. Equipment identification labels.
 - 6. Miscellaneous identification products.

1.2 ACTION SUBMITTALS

- A. Product Data: For each electrical identification product indicated.

1.3 QUALITY ASSURANCE

- A. Comply with ANSI A13.1.
- B. Comply with NFPA 70.
- C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.
- D. Comply with ANSI Z535.4 for safety signs and labels.
- E. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

PART 2 - PRODUCTS

2.1 CONDUCTOR IDENTIFICATION MATERIALS

- A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils (0.08 mm) thick by 1 to 2 inches (25 to 50 mm) wide.
- B. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.
- C. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.

- D. Write-On Tags: Polyester tag, 0.010 inch (0.25 mm) thick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.
 - 1. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.
 - 2. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

2.2 UNDERGROUND-LINE WARNING TAPE

- A. Tape:
 - 1. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines.
 - 2. Printing on tape shall be permanent and shall not be damaged by burial operations.
 - 3. Tape material and ink shall be chemically inert, and not subject to degrading when exposed to acids, alkalis, and other destructive substances commonly found in soils.
- B. Color and Printing:
 - 1. Comply with ANSI Z535.1 through ANSI Z535.5.
 - 2. Inscriptions for Red-Colored Tapes: ELECTRIC LINE, HIGH VOLTAGE.
 - 3. Inscriptions for Orange-Colored Tapes: TELEPHONE CABLE, CATV CABLE, COMMUNICATIONS CABLE, OPTICAL FIBER CABLE.

2.3 WARNING LABELS AND SIGNS

- A. Comply with NFPA 70 and 29 CFR 1910.145.
- B. Self-Adhesive Warning Labels: Factory-printed, multicolor, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment unless otherwise indicated.
- C. Baked-Enamel Warning Signs:
 - 1. Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application.
 - 2. 1/4-inch (6.4-mm) grommets in corners for mounting.
 - 3. Nominal size, 7 by 10 inches (180 by 250 mm).
- D. Warning label and sign shall include, but are not limited to, the following legends:
 - 1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
 - 2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES (915 MM)."

2.4 INSTRUCTION SIGNS

- A. Engraved, laminated acrylic or melamine plastic, minimum 1/16 inch (1.6 mm) thick for signs up to 20 sq. inches (129 sq. cm) and 1/8 inch (3.2 mm) thick for larger sizes.

1. Engraved legend with black letters on white face.
 2. Punched or drilled for mechanical fasteners.
 3. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.
- B. Adhesive Film Label: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch (10 mm).

2.5 EQUIPMENT IDENTIFICATION LABELS

- A. Self-Adhesive, Engraved, Laminated Acrylic or Melamine Label: Adhesive backed, with white letters on a dark-gray background. Minimum letter height shall be 3/8 inch (10 mm).

2.6 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Select paint system applicable for surface material and location (exterior or interior).
- B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.
- B. Apply identification devices to surfaces that require finish after completing finish work.
- C. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.
- D. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
- E. Underground-Line Warning Tape: During backfilling of trenches install continuous underground-line warning tape directly above line at 6 to 8 inches (150 to 200 mm) below finished grade. Use multiple tapes where width of multiple lines installed in a common trench or concrete envelope exceeds 16 inches (400 mm) overall.
- F. Painted Identification: Comply with requirements in painting Sections for surface preparation and paint application.
- G. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use color-coding conductor tape to identify the phase.
1. Color-Coding for Phase and Voltage Level Identification, 600 V or Less: Use colors listed below for ungrounded service, feeder and branch-circuit conductors.

- a. Color shall be factory applied or field applied for sizes larger than No. 8 AWG, if authorities having jurisdiction permit.
 - b. Colors for 208/120-V Circuits:
 - 1) Phase A: Black.
 - 2) Phase B: Red.
 - 3) Phase C: Blue.
 - c. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches (150 mm) from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.
- H. Install instructional sign including the color-code for grounded and ungrounded conductors using adhesive-film-type labels.
- I. Conductors to Be Extended in the Future: Attach write-on tags or marker tape to conductors and list source.
- J. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.
- 1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
 - 2. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.
 - 3. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual.
- K. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical fiber cable.
- 1. Limit use of underground-line warning tape to direct-buried cables.
 - 2. Install underground-line warning tape for both direct-buried cables and cables in raceway.
- L. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Self-adhesive warning labels.
- 1. Comply with 29 CFR 1910.145.
 - 2. Identify system voltage with black letters on an orange background.
 - 3. Apply to exterior of door, cover, or other access.
 - 4. For equipment with multiple power or control sources, apply to door or cover of equipment including, but not limited to, the following:
 - a. Power transfer switches.
 - b. Controls with external control power connections.
- M. Operating Instruction Signs: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.

- N. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.

1. Labeling Instructions:

- a. Indoor Equipment: Adhesive film label. Unless otherwise indicated, provide a single line of text with 1/2-inch- (13-mm-) high letters on 1-1/2-inch- (38-mm-) high label; where two lines of text are required, use labels 2 inches (50 mm) high.
- b. Outdoor Equipment: Engraved, laminated acrylic or melamine label 4 inches (100 mm) high.
- c. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
- d. Unless provided with self-adhesive means of attachment, fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.

END OF SECTION 26 0553

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SECTION 26 0923 - LIGHTING CONTROL DEVICES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Time switches.
 - 2. Photoelectric switches.
 - 3. Indoor occupancy and vacancy sensors.
 - 4. Switchbox-mounted occupancy and vacancy sensors
- B. Related Requirements:
 - 1. Section 26 2726 "Wiring Devices" for wall-box dimmers, non-networkable wall-switch occupancy sensors, and manual light switches.
 - 2. Refer to the Automatic Lighting Control Performance Specification, Automatic Lighting Control Device Schedule and Lighting Control Schedule on the Drawings.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings:
 - 1. Show installation details for the following:
 - a. Occupancy sensors.
 - b. Vacancy sensors.
 - 2. Interconnection diagrams showing field-installed wiring.
 - 3. Include diagrams for power, signal, and control wiring.

1.3 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.

1.4 WARRANTY

- A. Manufacturer's Warranty: Manufacturer and Installer agree to repair or replace lighting control devices that fail(s) in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Two year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 TIME SWITCHES

- 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. Cooper Industries, Inc.
 2. Intermatic, Inc.
 3. Leviton Manufacturing Co., Inc.
 4. NSi Industries LLC.
- B. Electronic Time Switches: Solid state, programmable, with alphanumeric display; complying with UL 917.
1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 2. Contact Configuration: SPST.
 3. Contact Rating: 20-A ballast load, 120-/240-V ac.
 4. Programs: Four on-off set points on a 24-hour schedule.
 5. Astronomic Time: Selected channels.
 6. Automatic daylight savings time changeover.
 7. Battery Backup: Not less than seven days reserve, to maintain schedules and time clock.

2.2 OUTDOOR PHOTOELECTRIC SWITCHES

- 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. Cooper Industries, Inc.
 2. Intermatic, Inc.
 3. Leviton Manufacturing Co., Inc.
 4. NSi Industries LLC.
- B. Description: Low voltage type, specific for interlocking with input to electronic time switch.

2.3 INDOOR OCCUPANCY AND VACANCY SENSORS

- 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. Cooper Industries, Inc.
 2. Hubbell Building Automation, Inc.
 3. Leviton Manufacturing Co., Inc.
 4. Lutron Electronics Co., Inc.
 5. Philips Lighting Controls.
 6. Sensor Switch, Inc.
- B. General Requirements for Sensors:

1. Wall or ceiling-mounted, solid-state indoor occupancy and vacancy sensors.
 2. Passive infrared, ultrasonic or dual technology, as identified on Drawings.
 3. Separate power pack.
 4. Hardwired connection to switch.
 5. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 6. Operation:
 - a. Occupancy Sensor: Unless otherwise indicated, turn lights on when coverage area is occupied, and turn them off when unoccupied; with a time delay for turning lights off, adjustable over a minimum range of 1 to 30 minutes.
 - b. Vacancy Sensor: Unless otherwise indicated, lights are manually turned on and sensor turns lights off when the room is unoccupied; with a time delay for turning lights off, adjustable over a minimum range of 1 to 30 minutes.
 - c. Combination Sensor: Unless otherwise indicated, sensor shall be programmed to turn lights on when coverage area is occupied and turn them off when unoccupied, or to turn off lights that have been manually turned on; with a time delay for turning lights off, adjustable over a minimum range of 1 to 30 minutes.
 7. Sensor Output: Sensor is powered from the power pack.
 8. Power: Line voltage.
 9. Power Pack: Dry contacts rated for 20-A LED load at 120- and 277-V ac, for 13-A tungsten at 120-V ac, and for 1 hp at 120-V ac. Sensor has 24-V dc, 150-mA, Class 2 power source, as defined by NFPA 70.
 10. Mounting:
 - a. Sensor: Suitable for mounting in any position on a standard outlet box.
 - b. Relay: Externally mounted through a 1/2-inch (13-mm) knockout in a standard electrical enclosure.
 - c. Time-Delay and Sensitivity Adjustments: Recessed and concealed behind hinged door.
 11. Indicator: Digital display, to show when motion is detected during testing and normal operation of sensor.
 12. Bypass Switch: Override the "on" function in case of sensor failure.
 13. Automatic Light-Level Sensor: Adjustable from 2 to 200 fc (21.5 to 2152 lux); turn lights off when selected lighting level is present.
- C. PIR Type: Wall or ceiling mounted, as indicated on Drawings; detect occupants in coverage area by their heat and movement.
1. Detector Sensitivity: Detect occurrences of 6-inch- (150-mm-) minimum movement of any portion of a human body that presents a target of not less than 36 sq. in. (232 sq. cm).
 2. Detection Coverage (Room, Ceiling Mounted): Detect occupancy anywhere in a circular area of 1000 sq. ft. (93 sq. m) when mounted on a 96-inch- (2440-mm-) high ceiling.
 3. Detection Coverage (Corridor, Ceiling Mounted): Detect occupancy within 90 feet (27.4 m) when mounted on a 10-foot- (3-m-) high ceiling.
 4. Detection Coverage (Room, Wall Mounted): Detect occupancy anywhere within a 180-degree pattern centered on the sensor over an area of 1000 square feet (110 square meters) when mounted 120 inches (3050 mm) above finished floor.
- D. Ultrasonic Type: Wall or ceiling mounted, as indicated on Drawings; detect occupants in coverage area through pattern changes of reflected ultrasonic energy.

1. Detector Sensitivity: Detect a person of average size and weight moving not less than 12 inches (305 mm) in either a horizontal or a vertical manner at an approximate speed of 12 inches/s (305 mm/s).
 2. Detection Coverage (Small Room): Detect occupancy anywhere within a circular area of 600 sq. ft. (56 sq. m) when mounted on a 96-inch- (2440-mm-) high ceiling.
 3. Detection Coverage (Standard Room): Detect occupancy anywhere within a circular area of 1000 sq. ft. (93 sq. m) when mounted on a 96-inch- (2440-mm-) high ceiling.
 4. Detection Coverage (Large Room): Detect occupancy anywhere within a circular area of 2000 sq. ft. (186 sq. m) when mounted on a 96-inch- (2440-mm-) high ceiling.
 5. Detection Coverage (Corridor): Detect occupancy anywhere within 90 feet (27.4 m) when mounted on a 10-foot- (3-m-) high ceiling in a corridor not wider than 14 feet (4.3 m).
 6. Detection Coverage (Room, Wall Mounted): Detect occupancy anywhere within a 180-degree pattern centered on the sensor over an area of 1000 square feet (110 square meters) when mounted 120 inches (3050 mm) above finished floor.
- E. Dual-Technology Type: Wall or ceiling mounted, as indicated on Drawings; detect occupants in coverage area using PIR and ultrasonic detection methods. The particular technology or combination of technologies that control on-off functions is selectable in the field by operating controls on unit.
1. Sensitivity Adjustment: Separate for each sensing technology.
 2. Detector Sensitivity: Detect occurrences of 6-inch- (150-mm-) minimum movement of any portion of a human body that presents a target of not less than 36 sq. in. (232 sq. cm), and detect a person of average size and weight moving not less than 12 inches (305 mm) in either a horizontal or a vertical manner at an approximate speed of 12 inches/s (305 mm/s).
 3. Detection Coverage (Standard Room): Detect occupancy anywhere within a circular area of 1000 sq. ft. (93 sq. m) when mounted on a 96-inch- (2440-mm-) high ceiling.
 4. Detection Coverage (Room, Wall Mounted): Detect occupancy anywhere within a 180-degree pattern centered on the sensor over an area of 1000 square feet (110 square meters) when mounted 120 inches (3050 mm) above finished floor.

2.4 SWITCHBOX-MOUNTED OCCUPANCY SENSORS

- 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. Cooper Industries, Inc.
 2. Hubbell Building Automation, Inc.
 3. Leviton Manufacturing Co., Inc.
 4. Lutron Electronics Co., Inc.
 5. Philips Lighting Controls.
 6. Sensor Switch, Inc.
- B. General Requirements for Sensors: Automatic-wall-switch occupancy sensor with manual on-off switch, suitable for mounting in a single gang switchbox, using hardwired connection.
1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 2. Occupancy Sensor Operation: Unless otherwise indicated, turn lights on when coverage area is occupied, and turn lights off when unoccupied; with a time delay for turning lights off, adjustable over a minimum range of 1 to 15 minutes.
 3. Operating Ambient Conditions: Dry interior conditions, 32 to 120 deg F (0 to 49 deg C).

4. Switch Rating: Not less than 800-VA LED load at 120 V, 1200-VA LED load at 277 V, and 800-W incandescent.
5. Switches shall be adjustable/programmable to operate in either occupancy or vacancy mode.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with NECA 1.
- B. Examine lighting control devices before installation. Reject lighting control devices that are wet, moisture damaged, or mold damaged.
- C. Coordinate layout and installation of ceiling-mounted devices with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, smoke detectors, fire-suppression systems, and partition assemblies.
- D. Install and aim sensors in locations to achieve not less than 90-percent coverage of areas indicated. Do not exceed coverage limits specified in manufacturer's written instructions.

3.2 WIRING INSTALLATION

- A. Wiring Method: Comply with Section 26 0519 "Low-Voltage Electrical Power Conductors and Cables." Minimum conduit size is 1/2 inch (13 mm).
- B. Wiring within Enclosures: Separate power-limited and nonpower-limited conductors according to conductor manufacturer's written instructions.
- C. Size conductors according to lighting control device manufacturer's written instructions unless otherwise indicated.
- D. Splices, Taps, and Terminations: Make connections only on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures.

3.3 IDENTIFICATION

- A. Identify components and power and control wiring according to Section 26 0553 "Identification for Electrical Systems."
- B. Label time switches with a unique designation for each channel.

3.4 FIELD QUALITY CONTROL

- A. Refer to commissioning requirements as identified in the Automatic Lighting Control Performance Specification on the Drawings.
- B. Perform the following tests and inspections:

1. Operational Test: After installing time switches and sensors, and after electrical circuitry has been energized, start units to confirm proper unit operation.
 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- C. Lighting control devices will be considered defective if they do not pass tests and inspections.
- D. Prepare test and inspection reports.

3.5 ADJUSTING

- A. Occupancy Adjustments: When requested within 12 months from date of Substantial Completion, provide on-site assistance in adjusting lighting control devices to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.
1. For occupancy and motion sensors, verify operation at outer limits of detector range. Set time delay to suit Owner's operations.
 2. For daylighting controls, adjust set points and deadband controls to suit Owner's operations.
 3. Align high-bay occupancy sensors using manufacturer's laser aiming tool.

3.6 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain lighting control devices.

END OF SECTION 26 0923

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 26 2416 - PANELBOARDS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Distribution panelboards.
 - 2. Lighting and appliance branch-circuit panelboards.

1.2 DEFINITIONS

- A. MCCB: Molded-case circuit breaker.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of panelboard.
- B. Shop Drawings: For each panelboard and related equipment.
 - 1. Include dimensioned plans, elevations, sections, and details.
 - 2. Detail enclosure types including mounting and anchorage, environmental protection, knockouts, corner treatments, covers and doors, gaskets, hinges, and locks.
 - 3. Detail bus configuration, current, and voltage ratings.
 - 4. Short-circuit current rating of panelboards and overcurrent protective devices.
 - 5. Include evidence of NRTL listing for series rating of installed devices.
 - 6. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
 - 7. Include time-current coordination curves for each type and rating of overcurrent protective device included in panelboards.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.

1.5 FIELD CONDITIONS

- A. Service Conditions: NEMA PB 1, usual service conditions, as follows:
 - 1. Ambient temperatures within limits specified.
 - 2. Altitude not exceeding 6600 feet (2000 m).

1.6 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace panelboards that fail in materials or workmanship within specified warranty period.
 - 1. Panelboard Warranty Period: 18 months from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PANELBOARDS COMMON REQUIREMENTS

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NEMA PB 1.
- C. Comply with NFPA 70.
- D. Enclosures: For flush or surface mounting as per Drawings, dead front cabinets.
 - 1. Rated for environmental conditions at installed location.
 - a. Indoor Dry and Clean Locations: NEMA 250, Type 1.
 - 2. Height: 90 inches (2286 mm) maximum.
 - 3. Front: Secured to box with screws. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box. Trims shall cover all live parts and shall have no exposed hardware.
 - 4. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover. Trims shall cover all live parts and shall have no exposed hardware.
- E. Incoming Mains Location: Top or bottom, as per Drawings and as verified by Contractor.
- F. Phase, Neutral, and Ground Buses: Tin-plated aluminum.
- G. Conductor Connectors: Suitable for use with conductor material and sizes.
 - 1. Material: Tin-plated aluminum.
 - 2. Main and Neutral Lugs: Compression type, with a lug on the neutral bar for each pole in the panelboard.
 - 3. Ground Lugs and Bus-Configured Terminators: Compression type, with a lug on the bar for each pole in the panelboard.
- H. NRTL Label: Panelboards shall be labeled by an NRTL acceptable to authority having jurisdiction for use as service equipment with one or more main service disconnecting and overcurrent protective devices. Panelboards shall have meter enclosures, wiring, connections, and other provisions for utility metering. Coordinate with utility company for exact requirements.
- I. Future Devices: Panelboards shall have mounting brackets, bus connections, filler plates, and necessary appurtenances required for future installation of devices.

- J. Panelboard Short-Circuit Current Rating: Rated for series-connected system with integral or remote upstream overcurrent protective devices and labeled by an NRTL. Include label or manual with size and type of allowable upstream and branch devices listed and labeled by an NRTL for series-connected short-circuit rating.

2.2 POWER PANELBOARDS

- A. 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:
 - 1. Eaton.
 - 2. General Electric Company; GE Energy Management - Electrical Distribution.
 - 3. Siemens Industry, Inc., Energy Management Division.
 - 4. Square D; by Schneider Electric.
- B. Panelboards: NEMA PB 1, distribution type.
- C. Doors: Secured with vault-type latch with tumbler lock; keyed alike.
- D. Mains: Circuit breaker or lugs only, as per Drawings.
- E. Branch Overcurrent Protective Devices for Circuit-Breaker Frame Sizes 125 A and Smaller: Plug-in circuit breakers. Bolt-on circuit breakers.
- F. Branch Overcurrent Protective Devices for Circuit-Breaker Frame Sizes Larger Than 125 A: Bolt-on circuit breakers.

2.3 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Eaton.
 - 2. General Electric Company; GE Energy Management - Electrical Distribution.
 - 3. Siemens Industry, Inc., Energy Management Division.
 - 4. Square D; by Schneider Electric.
- B. Panelboards: NEMA PB 1, lighting and appliance branch-circuit type.
- C. Mains: Circuit breaker or lugs only, as per Drawings.
- D. Branch Overcurrent Protective Devices: Plug-in circuit breakers, replaceable without disturbing adjacent units.
- E. Doors: Concealed hinges; secured with flush latch with tumbler lock; keyed alike.

2.4 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

- A. Provide standard products of the same manufacturer as the panelboard.

- B. MCCB: Comply with UL 489, with series-connected rating to meet available fault currents.
1. Thermal-Magnetic Circuit Breakers:
 - a. Inverse time-current element for low-level overloads.
 - b. Instantaneous magnetic trip element for short circuits.
 - c. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
 2. Adjustable Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
 3. Electronic Trip Circuit Breakers:
 - a. RMS sensing.
 - b. Field-replaceable rating plug or electronic trip.
 - c. Digital display of settings, trip targets, and indicated metering displays.
 - d. Multi-button keypad to access programmable functions and monitored data.
 - e. Ten-event, trip-history log. Each trip event shall be recorded with type, phase, and magnitude of fault that caused the trip.
 - f. Integral test jack for connection to portable test set or laptop computer.
 - g. Field-Adjustable Settings:
 - 1) Instantaneous trip.
 - 2) Long- and short-time pickup levels.
 - 3) Long and short time adjustments.
 - 4) Ground-fault pickup level, time delay, and I squared T response.
 4. MCCB Features and Accessories:
 - a. Standard frame sizes, trip ratings, and number of poles.
 - b. Breaker handle indicates tripped status.
 - c. UL listed for reverse connection without restrictive line or load ratings.
 - d. Lugs: Compression style, suitable for number, size, trip ratings, and conductor materials.
 - e. Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at [55] [75] percent of rated voltage.
 - f. Handle Padlocking Device: Metallic, fixed attachment, for locking circuit-breaker handle in on or off position.
 - g. Handle Clamp: Loose attachment, for holding circuit-breaker handle in on position.

2.5 IDENTIFICATION

- A. Panelboard Label: Manufacturer's name and trademark, voltage, amperage, number of phases, and number of poles shall be located on the interior of the panelboard door.
- B. Breaker Labels: Faceplate shall list current rating, UL and IEC certification standards, and AIC rating.
- C. Circuit Directory: Directory card inside panelboard door, mounted in transparent card holder.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with NECA 1.
- B. Install panelboards and accessories according to NEMA PB 1.1.
- C. Mount top of trim 90 inches (2286 mm) above finished floor unless otherwise indicated.
- D. Mount panelboard cabinet plumb and rigid without distortion of box.
- E. Mount recessed panelboards with fronts uniformly flush with wall finish and mating with back box.
- F. Install overcurrent protective devices and controllers not already factory installed.
 - 1. Set field-adjustable, circuit-breaker trip ranges.
- G. Make grounding connections and bond neutral for services and separately derived systems to ground. Make connections to grounding electrodes, separate grounds for isolated ground bars, and connections to separate ground bars.
- H. Install filler plates in unused spaces.
- I. Arrange conductors in gutters into groups and bundle and wrap with wire ties.

3.2 IDENTIFICATION

- A. Identify field-installed conductors, interconnecting wiring, and components; install warning signs complying with requirements in Section 26 0553 "Identification for Electrical Systems."
- B. Create a directory to indicate installed circuit loads; incorporate Owner's final room designations. Obtain approval before installing. Handwritten directories are not acceptable. Install directory inside panelboard door.
- C. Panelboard Nameplates: Label each panelboard with a nameplate complying with requirements for identification specified in Section 26 0553 "Identification for Electrical Systems."
- D. Device Nameplates: Label each branch circuit device in power panelboards with a nameplate complying with requirements for identification specified in Section 26 0553 "Identification for Electrical Systems."
- E. Install warning signs complying with requirements in Section 26 0553 "Identification for Electrical Systems" identifying source of remote circuit.

3.3 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Acceptance Testing Preparation:

1. Test continuity of each circuit.
- C. Tests and Inspections:
1. Perform each visual and mechanical inspection and electrical test for low-voltage air circuit breakers stated in NETA ATS. Certify compliance with test parameters.
 2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
- D. Panelboards will be considered defective if they do not pass tests and inspections.
- E. Prepare test and inspection reports, including a certified report that identifies panelboards included and that describes scanning results, with comparisons of the two scans. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

END OF SECTION 26 2416

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 26 2726 - WIRING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Standard-grade receptacles.
 - 2. USB receptacles.
 - 3. GFCI receptacles.
 - 4. Toggle switches, 120/277 V.
 - 5. Wall plates.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 GENERAL WIRING-DEVICE REQUIREMENTS

- A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
- B. Comply with NFPA 70.
- C. RoHS compliant.
- D. Comply with NEMA WD 1.
- E. Device Color:
 - 1. Wiring Devices Connected to Normal Power System: White, unless otherwise indicated or required by NFPA 70 or device listing.
- F. Wall Plate Color: For plastic covers, match device color.
- G. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

2.2 STANDARD-GRADE RECEPTACLES, 125 V, 20 A

A. Tamper-Resistant Duplex Receptacles, 125 V, 20 A:

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. Eaton (Arrow Hart).
 - b. Hubbell Incorporated; Wiring Device-Kellems.
 - c. Legrand/Pass & Seymour
 - d. Leviton Manufacturing Co., Inc.
2. Description: Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle.
3. Configuration: NEMA WD 6, Configuration 5-20R.
4. Standards: Comply with UL 498 and FS W-C-596.
5. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" Article.

B. Weather-Resistant Duplex Receptacle, 125 V, 20 A:

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. Eaton (Arrow Hart).
 - b. Hubbell Incorporated; Wiring Device-Kellems.
 - c. Legrand/Pass & Seymour
 - d. Leviton Manufacturing Co., Inc.
2. Description: Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Square face.
3. Configuration: NEMA WD 6, Configuration 5-20R.
4. Standards: Comply with UL 498.
5. Marking: Listed and labeled as complying with NFPA 70, "Receptacles in Damp or Wet Locations" Article.

2.3 STANDARD-GRADE RECEPTACLES, 125 V, 15 A

A. Tamper-Resistant Duplex Receptacles, 125 V, 15 A:

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. Eaton (Arrow Hart).
 - b. Hubbell Incorporated; Wiring Device-Kellems.
 - c. Legrand/Pass & Seymour
 - d. Leviton Manufacturing Co., Inc.
2. Description: Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle.
3. Configuration: NEMA WD 6, Configuration 5-15R.
4. Standards: Comply with UL 498 and FS W-C-596.

5. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" Article.
- B. Weather-Resistant Duplex Receptacle, 125 V, 15 A:
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. Eaton (Arrow Hart).
 - b. Hubbell Incorporated; Wiring Device-Kellems.
 - c. Legrand/Pass & Seymour
 - d. Leviton Manufacturing Co., Inc.
 2. Description: Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Square face.
 3. Configuration: NEMA WD 6, Configuration 5-15R.
 4. Standards: Comply with UL 498.
 5. Marking: Listed and labeled as complying with NFPA 70, "Receptacles in Damp or Wet Locations" Article.

2.4 USB RECEPTACLES

- A. USB Charging Receptacles, 125 V, 20 A:
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. Eaton (Arrow Hart).
 - b. Hubbell Incorporated; Wiring Device-Kellems.
 - c. Legrand/Pass & Seymour
 - d. Leviton Manufacturing Co., Inc.
 2. Description: Two pole, three wire, and self-grounding. Single-piece, rivetless, nickel-plated, all-brass grounding system. Nickel-plated, brass mounting strap.
 3. Configuration: NEMA WD 6, Configuration 5-20R.
 4. Combination Tamper-Resistant Specification Grade Duplex Convenience Receptacles with (2) USB ports, 125 V, 20 A; overall 30W charging capability with (1) USB Type-A & (1) USB Type-C port powered by smart current sharing technology to allow for full 3A through a singular Type-C port.; slim design allows for installation in standard depth wall boxes; reinforced nylon USB Type-A ports; Stainless steel auto-ground clips assure positive ground; efficient power supply meets the US Department of Energy Level VI no-load power requirement of 100mW max for external power supplies.
 5. Comply with NEMA WD 1, NEMA WD 6 configuration 5-20R, UL 498 Supplement SD, UL 1310, CSA C22.2 No. 42, CSA 22.2 No. 223 and Federal Specification W-C-596.GFCI RECEPTACLES, 125 V, 20 A

2.5 GFCI RECEPTACLES, 125 V, 20 A

- A. Tamper-Resistant Duplex GFCI Receptacles, 125 V, 20 A:

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. Eaton (Arrow Hart).
 - b. Hubbell Incorporated; Wiring Device-Kellems.
 - c. Legrand/Pass & Seymour
 - d. Leviton Manufacturing Co., Inc.
2. Description: Integral GFCI with "Test" and "Reset" buttons and LED indicator light. Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle.
3. Configuration: NEMA WD 6, Configuration 5-20R.
4. Type: Feed-through.
5. Standards: Comply with UL 498, UL 943 Class A, and FS W-C-596.
6. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" Article.

2.6 TOGGLE SWITCHES, 120/277 V, 20 A

A. Single-Pole Switches, 120/277 V, 20 A:

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. Eaton (Arrow Hart).
 - b. Hubbell Incorporated; Wiring Device-Kellems.
 - c. Legrand/Pass & Seymour
 - d. Leviton Manufacturing Co., Inc.
2. Standards: Comply with UL 20 and FS W-S-896.

2.7 TIMER LIGHT SWITCH

A. Digital Timer Light Switch:

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. Eaton (Arrow Hart).
 - b. Hubbell Incorporated; Wiring Device-Kellems.
 - c. Legrand/Pass & Seymour
 - d. Leviton Manufacturing Co., Inc.
2. Standards: Comply with UL 20.
3. Description: Switchbox-mounted, combination digital timer and conventional switch lighting-control unit, with backlit digital display, with selectable time interval in 10-minute increments.
4. Rated 960 W at 120 V ac for tungsten lighting, 10 A at 120 V ac or 10 A at 277 V ac for fluorescent or LED lighting, and 1/4 hp at 120 V ac.
5. Integral relay for connection to BAS.

2.8 WALL PLATES

- A. Single Source: Obtain wall plates from same manufacturer of wiring devices.
- B. Single and combination types shall match corresponding wiring devices.
 - 1. Plate-Securing Screws: Metal with head color to match plate finish.
 - 2. Material for Finished Spaces: Smooth, high-impact thermoplastic.
 - 3. Material for Unfinished Spaces: Galvanized steel.
 - 4. Material for Damp Locations: Cast aluminum with spring-loaded lift cover, and listed and labeled for use in wet and damp locations.
- C. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with Type 3R, weather-resistant, die-cast aluminum with while-in-use with lockable cover.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.
- B. Coordination with Other Trades:
 - 1. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
 - 2. Install wiring devices after all wall preparation, including painting, is complete.
- C. Device Installation:
 - 1. Connect devices to branch circuits using pigtails that are not less than 6 inches (152 mm) in length.
 - 2. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.
- D. Receptacle Orientation:
 - 1. Install ground pin of vertically mounted receptacles up, and on horizontally mounted receptacles to the right.
- E. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.
- F. Wet-Location, Weatherproof devices mounted on stud wall shall be mounted on flush/recessed box. Surface boxes shall only be allowed where installed on concrete wall/foundation, where mounted on equipment or when located in an area specifically identified for surface wiring methods.
- G. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.

3.2 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. Tests for Receptacles:
 - a. Line Voltage: Acceptable range is 105 to 132 V.
 - b. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is unacceptable.
 - c. Ground Impedance: Values of up to 2 ohms are acceptable.
 - d. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
 - e. Using the test plug, verify that the device and its outlet box are securely mounted.
- B. Test straight-blade convenience outlets in patient-care areas for the retention force of the grounding blade according to NFPA 99. Retention force shall be not less than 4 oz. (115 g).
- C. Wiring device will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

END OF SECTION 26 2726

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 26 2816 - ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Fusible switches.
 - 2. Nonfusible switches.
 - 3. Molded-case circuit breakers (MCCBs).
 - 4. Molded-case switches.
 - 5. Enclosures.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated. Include nameplate ratings, dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.
 - 1. Include time-current coordination curves (average melt) for each type and rating of overcurrent protective device; include selectable ranges for each type of overcurrent protective device. Provide in PDF electronic format.
- B. Shop Drawings: For enclosed switches and circuit breakers.
 - 1. Include plans, elevations, sections, details, and attachments to other work.
 - 2. Include wiring diagrams for power, signal, and control wiring.

1.3 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Accredited by NETA.

1.4 WARRANTY

- A. Manufacturer's Warranty: Manufacturer and Installer agree to repair or replace components that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: One year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

- A. Source Limitations: Obtain enclosed switches and circuit breakers, overcurrent protective devices, components, and accessories, within same product category, from single manufacturer.
- B. Product Selection for Restricted Space: Drawings indicate maximum dimensions for enclosed switches and circuit breakers, including clearances between enclosures, and adjacent surfaces and other items. Comply with indicated maximum dimensions.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by an NRTL, and marked for intended location and application.
- D. Comply with NFPA 70.

2.2 FUSIBLE SWITCHES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. ABB, Electrification Products Division.
 - 2. Eaton.
 - 3. Siemens Industry, Inc., Energy Management Division.
 - 4. Square D; Schneider Electric USA.
- B. Type HD, Heavy Duty:
 - 1. Single throw.
 - 2. Three pole.
 - 3. 240-V ac.
 - 4. 200 A and smaller.
 - 5. UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate indicated fuses.
 - 6. Lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.
- C. Accessories:
 - 1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
 - 2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
 - 3. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.

2.3 NONFUSIBLE SWITCHES

- 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. ABB, Electrification Products Division.
 2. Eaton.
 3. Siemens Industry, Inc., Energy Management Division.
 4. Square D; Schneider Electric USA.
- B. Type GD, General Duty, Three Pole, Single Throw, 240-V ac, 600 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept two padlocks, and interlocked with cover in closed position.
- C. Accessories:
1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
 2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.

2.4 MOLDED-CASE CIRCUIT BREAKERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. ABB, Electrification Products Division.
 2. Eaton.
 3. Siemens Industry, Inc., Energy Management Division.
 4. Square D; Schneider Electric USA.
- B. Circuit breakers shall be constructed using glass-reinforced insulating material. Current carrying components shall be completely isolated from the handle and the accessory mounting area.
- C. Circuit breakers shall have a toggle operating mechanism with common tripping of all poles, which provides quick-make, quick-break contact action. The circuit-breaker handle shall be over center, be trip free, and reside in a tripped position between on and off to provide local trip indication. Circuit-breaker escutcheon shall be clearly marked on and off in addition to providing international I/O markings. Equip circuit breaker with a push-to-trip button, located on the face of the circuit breaker to mechanically operate the circuit-breaker tripping mechanism for maintenance and testing purposes.
- D. The maximum ampere rating and UL, IEC, or other certification standards with applicable voltage systems and corresponding interrupting ratings shall be clearly marked on face of circuit breaker. Circuit breakers shall be fully rated for available fault current.
- E. MCCBs shall be equipped with a device for locking in the isolated position.
- F. Lugs shall be suitable for 167 deg F (75 deg C) rated wire.
- G. Standards: Comply with UL 489 with interrupting capacity to comply with available fault currents.
- H. Thermal-Magnetic Circuit Breakers: Inverse time-current thermal element for low-level overloads and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
- I. Features and Accessories:

1. Standard frame sizes, trip ratings, and number of poles.

2.5 ENCLOSURES

- A. Enclosed Switches and Circuit Breakers: UL 489, NEMA KS 1, NEMA 250, and UL 50, to comply with environmental conditions at installed location.
- B. Enclosure Finish: The enclosure shall be finished with gray baked enamel paint, electrodeposited on cleaned, phosphatized steel (NEMA 250 Type 1); gray baked enamel paint, electrodeposited on cleaned, phosphatized galvanized steel (NEMA 250 Types 3R, 12).
- C. Conduit Entry: NEMA 250 Types 3R shall have no top entry for raceways.
- D. Operating Mechanism: The circuit-breaker operating handle shall be externally operable with the operating mechanism being an integral part of the box, not the cover, directly operable through the dead front trim of the enclosure (NEMA 250 Type 3R), lockable in either open or closed position. The cover interlock mechanism shall have an externally operated override. The override shall not permanently disable the interlock mechanism, which shall return to the locked position once the override is released. The tool used to override the cover interlock mechanism shall not be required to enter the enclosure in order to override the interlock.

PART 3 - EXECUTION

3.1 ENCLOSURE ENVIRONMENTAL RATING APPLICATIONS

- A. Enclosed Switches and Circuit Breakers: Provide enclosures at installed locations with the following environmental ratings.
 1. Indoor, Dry and Clean Locations: NEMA 250, Type 1.
 2. Outdoor Locations: NEMA 250, Type 3R.
 3. Other Wet or Damp, Indoor Locations: NEMA 250, Type 4.

3.2 INSTALLATION

- A. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:
 1. Notify General Contractor and Owner no fewer than seven days in advance of proposed interruption of electric service.
 2. Indicate method of providing temporary electric service.
 3. Do not proceed with interruption of electric service without Owner's written permission.
 4. Comply with NFPA 70E.
- B. Coordinate layout and installation of switches, circuit breakers, and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

- C. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.
- D. Install fuses in fusible devices.
- E. Comply with NFPA 70 and NECA 1.

3.3 IDENTIFICATION

- A. Comply with requirements in Section 26 0553 "Identification for Electrical Systems."
 - 1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
 - 2. Label each enclosure with engraved metal or laminated-plastic nameplate.

3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- C. Perform tests and inspections.
- D. Tests and Inspections for Switches:
 - 1. Visual and Mechanical Inspection:
 - a. Inspect physical and mechanical condition.
 - b. Inspect anchorage, alignment, grounding, and clearances.
 - c. Verify that the unit is clean.
 - d. Verify blade alignment, blade penetration, travel stops, and mechanical operation.
 - e. Verify that fuse sizes and types match the Specifications and Drawings.
 - f. Verify that each fuse has adequate mechanical support and contact integrity.
 - g. Inspect bolted electrical connections for high resistance using one of the two following methods:
 - 1) Use a low-resistance ohmmeter.
 - a) Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from those of similar bolted connections by more than 50 percent of the lowest value.
 - 2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data or NETA ATS Table 100.12.
 - a) Bolt-torque levels shall be in accordance with manufacturer's published data. In the absence of manufacturer's published data, use NETA ATS Table 100.12.

- h. Verify correct phase barrier installation.
 - i. Verify lubrication of moving current-carrying parts and moving and sliding surfaces.
- E. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.
- F. Prepare test and inspection reports.
 - 1. Test procedures used.
 - 2. Include identification of each enclosed switch and circuit breaker tested and describe test results.
 - 3. List deficiencies detected, remedial action taken, and observations after remedial action.

END OF SECTION 26 2816

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 26 2913 - MANUAL AND MAGNETIC MOTOR CONTROLLERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Manual motor controllers.
 - 2. Enclosures.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 MANUAL MOTOR CONTROLLERS

- A. Motor-Starting Switches (MSS): "Quick-make, quick-break" toggle or push-button action; marked to show whether unit is off or on.
 - 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. Eaton.
 - b. Rockwell Automation, Inc.
 - c. Schneider Electric USA (Square D).
 - d. Siemens Industry, Inc., Energy Management Division.
 - 2. Standard: Comply with NEMA ICS 2, general purpose, Class A.
 - 3. Configuration: Nonreversing.

2.2 ENCLOSURES

- A. Comply with NEMA 250, type designations as indicated on Drawings, complying with environmental conditions at installed location.
- B. The construction of the enclosures shall comply with NEMA ICS 6.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with NECA 1.
- B. Maintain minimum clearances and workspace at equipment according to manufacturer's written instructions and NFPA 70.

3.2 IDENTIFICATION

- A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 26 0553 "Identification for Electrical Systems."

END OF SECTION 26 2913

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 26 5100 - LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Luminaires.
 - 2. Emergency lighting units.
 - 3. Exit signs.
- B. Related Sections:
 - 1. Section 26 0923 "Lighting Control Devices" for automatic control of lighting, including time switches.
 - 2. Refer to the Automatic Lighting Control Performance Specification, Automatic Lighting Control Device Schedule and Lighting Control Schedule on the Drawings.

1.2 DEFINITIONS

- A. CCT: Correlated color temperature.
- B. CRI: Color Rendering Index.
- C. Emergency Lighting Unit: A lighting unit with integral or remote emergency battery powered supply and the means for controlling and charging the battery and unit operation.
- D. Fixture: See "Luminaire" Paragraph.
- E. Lumen: Measured output of lamp and luminaire, or both.
- F. Luminaire: Complete lighting unit, including lamp, reflector, and housing.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of lighting fixture, arranged in order of fixture designation. Include data on features, accessories, and finishes.
- B. Shop Drawings: Show details of nonstandard or custom lighting fixtures. Indicate dimensions, weights, methods of field assembly, components, features, and accessories. Product Certificates: For each type of ballast or driver for bi-level and dimmer-controlled fixtures, from manufacturer.
 - 1. For LED luminaires, submit US DOE LED Lighting Facts label, and IES L70 rated life.

- C. Photometric point-by-point calculations may be requested for luminaires submitted which are not listed in the Luminaire Schedule on the Drawings. If requested, provide point-by-point calculations for specific spaces. Electronic floor plans (AutoCAD or PDF files) will be provided as available and interior finishes and furniture information can be provided.

1.4 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. 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.
- C. NRTL Compliance: Fabricate and label emergency lighting units, exit signs, and batteries to comply with UL 924.
- D. Comply with NFPA 70 and NFPA 101.
- E. Comply with NEMA LE 4 for recessed luminaires.
- F. Comply with UL 1598 for recessed luminaires.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide the basis of design product indicated on Drawings or equal products from other manufacturers.
 - A. Luminaires of equal function, performance, energy efficiency, lamp type, material grade and construction to the specified luminaire in the Luminaire Schedule may be acceptable upon Engineer's review.
 - B. If an alternate lighting package is proposed, this Contractor shall provide complete review of the alternative lighting package including the luminaire cut sheets and point by point calculations, prior to submittal to the Engineer, to confirm that the products are equal. This Contractor will be responsible for all alterations (materials and labor) before and after installation if the system does not perform as indicated in the submittals. If alternate products are not approved, this Contractor shall be responsible to find equal luminaire or provide specified luminaire at no additional cost to the Owner. The delivery delay, if any, for submitting not equal products shall be this Contractor's responsibility.
 - C. If an alternative luminaires are proposed in lieu of the specified basis of design products, the contractor shall include with the review package, the value of the credit which will be applied to the project if the alternative luminaires are accepted as an approved equal.

2.2 GENERAL REQUIREMENTS FOR LIGHTING FIXTURES AND COMPONENTS

- A. Recessed Fixtures: Comply with NEMA LE 4 for ceiling compatibility for recessed fixtures.
- B. LED Fixtures: Comply with UL 8750-09; NEMA SSL-1-10; IES LM-80-08 and LM-82-12.
- C. Metal Parts: Free of burrs and sharp corners and edges.
- D. Sheet Metal Components: Steel unless otherwise indicated. Form and support to prevent warping and sagging.
- E. 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.
- F. Diffusers and Globes:
 - 1. Acrylic Lighting Diffusers: 100 percent virgin acrylic plastic. High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
 - a. Lens Thickness: At least 0.125 inch (3.175 mm) minimum unless otherwise indicated.
 - b. UV stabilized.
 - 2. Glass: Annealed crystal glass unless otherwise indicated.

2.3 LED LIGHT FIXTURES

- A. General:
 - 1. LED light fixtures shall be in accordance with IES, NFPA, UL, as shown on the drawings, and as specified.
 - 2. LED light fixtures shall be Reduction of Hazardous Substances (RoHS)-compliant.
 - 3. LED drivers shall include the following features unless otherwise indicated:
 - a. Minimum efficiency: 85% at full load.
 - b. Minimum Operating Ambient Temperature: -20° C. (-4° F.)
 - c. Input Voltage: 120 - 277V (±10%) at 60 Hz.
 - d. Integral short circuit, open circuit, and overload protection.
 - e. Power Factor: ≥ 0.95.
 - f. Total Harmonic Distortion: ≤ 20%.
 - g. Comply with FCC 47 CFR Part 15.
 - 4. LED modules shall include the following features unless otherwise indicated:
 - a. Comply with IES LM-79 and LM-80 requirements.
 - b. Minimum CRI 80 and color temperature 3000° K unless otherwise specified in the Luminaire Schedule on the Drawings.
 - c. Minimum Rated Life: 50,000 hours per IES L70.
 - d. Light output lumens as indicated in the Luminaire Schedule on the Drawings.

B. LED Downlights:

1. Housing, LED driver, and LED module shall be products of the same manufacturer.

C. LED Troffers:

1. LED drivers, modules, and reflector shall be accessible, serviceable, and replaceable from below the ceiling.
2. Housing, LED driver, and LED module shall be products of the same manufacturer.

2.4 EXIT SIGNS

A. General Requirements for Exit Signs: Comply with UL 924; for sign colors, visibility, luminance, and lettering size, comply with authorities having jurisdiction.

B. Internally Lighted Signs:

1. Lamps for AC Operation: LEDs, 50,000 hours minimum rated lamp life.
2. Self-Powered Exit Signs (Battery Type): Integral automatic charger in a self-contained power pack.
 - a. Battery: Sealed, maintenance-free, nickel-cadmium type.
 - b. Charger: Fully automatic, solid-state type with sealed transfer relay.
 - c. Operation: Relay automatically energizes lamp from battery when circuit voltage drops to 80 percent of nominal voltage or below. When normal voltage is restored, relay disconnects lamps from battery, and battery is automatically recharged and floated on charger.
 - d. Test Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
 - e. LED Indicator Light: Indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.

2.5 EMERGENCY LIGHTING UNITS

A. General Requirements for Emergency Lighting Units: Self-contained units complying with UL 924.

1. Battery: Sealed, maintenance-free, lead-acid type.
2. Charger: Fully automatic, solid-state type with sealed transfer relay.
3. Operation: Relay automatically turns lamp on when power-supply circuit voltage drops to 80 percent of nominal voltage or below. Lamp automatically disconnects from battery when voltage approaches deep-discharge level. When normal voltage is restored, relay disconnects lamps from battery, and battery is automatically recharged and floated on charger.
4. Test Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
5. LED Indicator Light: Indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.
6. Wire Guard: Heavy-chrome-plated wire guard protects lamp heads or fixtures.

2.6 LIGHTING FIXTURE SUPPORT COMPONENTS

- A. Comply with Section 26 0529 "Hangers and Supports for Electrical Systems" for channel- and angle-iron supports and nonmetallic channel and angle supports.
- B. Wires: ASTM A 641/A 641M, Class 3, soft temper, zinc-coated steel, 12 gage (2.68 mm).

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Lighting fixtures: Set level, plumb, and square with ceilings and walls. Install lamps in each fixture.
- B. Comply with NFPA 70 for minimum fixture supports.
- C. Adjust aimable lighting fixtures to provide required light intensities.
- D. Connect wiring according to Section 26 0519 "Low-Voltage Electrical Power Conductors and Cables."

3.2 FIELD QUALITY CONTROL

- A. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery and retransfer to normal.
- B. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

END OF SECTION 26 5100

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SECTION 27 1100 - COMMUNICATIONS EQUIPMENT ROOM FITTINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Backboards.
 - 2. Boxes, enclosures, and cabinets.
 - 3. UPS power strips.
- B. Related Requirements:
 - 1. Section 27 1513 "Communications Copper Horizontal Cabling" for copper data cabling associated with system panels and devices.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 BACKBOARDS

- A. Backboards: Plywood, fire-retardant treated, 3/4 by 48 by 96 inches (19 by 1220 by 2440 mm).
- B. Backboard Paint: Light-colored fire-retardant paint.

2.2 POWER STRIPS

- A. Comply with requirements in Section 27 1116 "Communications Racks, Frames, and Enclosures."
- B. Power Strips: Comply with UL 1363.
 - 1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 - 2. Rack mounting, with flanges.
 - 3. Housing: Metal.
 - 4. 1500VA/1000W battery backup uninterruptible power supply (UPS)
 - 5. Cloud-enabled distributed for remote access, notifications and firmware updates, RJ-45 connection.

6. Pure sine wave output while on battery provides the highest degree of compatibility for active PFC (power factor corrected) servers and sensitive electronics.
 7. Automatic Voltage Regulation (AVR) adjusts high and low voltages to a safe level, ensuring your equipment had reliable power and preserving the life of the battery
 8. Six, 15-A, 120-V ac, NEMA WD 6, Configuration 5-15R receptacles.
 9. Rear-facing receptacles.
 10. LED indicator lights for power and protection status.
 11. LED indicator lights for reverse polarity and open outlet ground.
 12. Circuit Breaker and Thermal Fusing: Unit continues to supply power if protection is lost.
 13. Cord connected with 15-foot (4.5-m) line cord.
 14. Surge Protection: UL 1449, Type 3.
- C. Basis of design is APC Smart-UPS 1500VA rack mount LCD 120V with SmartConnect port, or approved equal.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with NECA 1.
- B. Comply with BICSI's "Telecommunications Distribution Methods Manual" for layout of communications equipment spaces.
- C. Comply with BICSI's "Information Technology Systems Installation Methods Manual" for installation of equipment in communications equipment spaces.
- D. Bundle, lace, and train conductors and cables to terminal points without exceeding manufacturer's limitations on bending radii. Install lacing bars and distribution spools.
- E. Coordinate layout and installation of communications equipment in tracks and in room. Coordinate service entrance configuration with service provider.
- F. Coordinate location of power raceways and receptacles with locations of communications equipment requiring electrical power to operate.
- G. Backboards:
 1. Install from 6 inches (150 mm) to 8 feet, 6 inches (2588 mm) above finished floor. If plywood is fire rated, ensure that fire-rating stamp is visible after installation.
 2. Paint all sides of backboard with two coats of paint[, leaving fire rating stamp visible].
 3. Comply with requirements for backboard installation in BICSI's "Information Technology Systems Installation Methods Manual" and TIA-569-D.

END OF SECTION 27 1100

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 27 1116 - COMMUNICATIONS RACKS, FRAMES, AND ENCLOSURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. 19-inch equipment racks.
 - 2. 19-inch wall-mounted equipment cabinets.
 - 3. Grounding.
 - 4. Labeling.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 19-INCH EQUIPMENT RACKS

- A. Description: Two-post racks with threaded rails designed for mounting telecommunications equipment. Width is compatible with EIA/ECIA 310-E, 19-inch (482.6-mm) equipment mounting with an opening of 17.72-inches (450-mm) between rails.
- B. 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. Belden Inc.
 - 2. CommScope, Inc.
 - 3. Eaton (B-line).
 - 4. Emerson Network Power Connectivity Solutions.
 - 5. Hubbell Premise Wiring; Hubbell Incorporated, Commercial and Industrial.
 - 6. Leviton Manufacturing Co., Inc.
 - 7. Middle Atlantic Products; Legrand North America, LLC.
 - 8. Ortronics, Inc.
 - 9. Panduit Corp.
 - 10. Siemon Co. (The).
 - 11. Tripp-Lite.
- C. General Requirements:
 - 1. Frames: Modular units designed for telecommunications terminal support and coordinated with dimensions of units to be supported.

2. Material: Extruded aluminum.
3. Finish: Manufacturer's standard, baked-polyester powder coat.
4. Color: Black.

D. Floor-Mounted Racks:

1. Overall Height: 72 inches (1828.8 mm).
2. Overall Depth: 23 inches (584.2 mm).
3. Upright Depth: 3 inches (76.2 mm).
4. Two-Post Load Rating: 200 lb (91 kg).
5. Number of Rack Units per Rack: 45.
 - a. Numbering: Every rack units, on interior of rack.
6. Vertical and horizontal cable management channels, top and bottom cable troughs, grounding lug, and a power strip.
7. Base shall have a minimum of four mounting holes for permanent attachment to floor.
8. Top shall have provisions for attaching to cable tray or ceiling.
9. Self-leveling.

E. Cable Management:

1. Metal, with integral wire retaining fingers.
2. Baked-polyester powder coat finish.
3. Vertical cable management panels shall have front and rear channels, with covers.
4. Provide horizontal crossover cable manager at the top of each relay rack, with a minimum height of two rack units each.

2.2 GROUNDING

- A. Comply with requirements in Section 26 0526 "Grounding and Bonding for Electrical Systems" for grounding conductors and connectors.
- B. Rack and Cabinet TGBs: Rectangular bars of hard-drawn solid copper, accepting conductors ranging from No. 14 to No. 2/0 AWG, NRTL listed as complying with UL 467, and complying with TIA-606-B. Predrilling shall be with holes for use with lugs specified in this Section.
1. Rack-Mounted Horizontal TGB: Designed for mounting in 19- or 23-inch (482.6- or 584.2-mm) equipment racks. Include a copper splice bar for transitioning to an adjoining rack, and stainless-steel or copper-plated hardware for attachment to the rack.
 2. Rack-Mounted Vertical TGB: 72 or 36 inches (1828.8 or 914.4 mm) long, with stainless-steel or copper-plated hardware for attachment to rack.

2.3 LABELING

- A. Comply with TIA-606-B and UL 969 for a system of labeling materials, including label stocks, laminating adhesives, and inks used by label printers.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with NECA 1.
- B. Bundle, lace, and train conductors and cables to terminal points without exceeding manufacturer's limitations on bending radii. Install lacing bars and distribution spools.
- C. Coordinate layout and installation of communications equipment in racks and room. Coordinate service entrance configuration with service provider.
 - 1. Meet with Construction Manager and Owner to exchange information and agree on details of equipment configurations and installation interfaces.
 - 2. Record agreements reached in meetings and distribute them to other participants.
 - 3. Adjust configurations and locations of distribution frames, cross-connects, and patch panels in equipment spaces to accommodate and optimize configuration and space requirements of telecommunications equipment.
 - 4. Adjust configurations and locations of equipment with distribution frames, cross-connects, and patch panels of cabling systems of other communications, electronic safety and security, and related systems that share space in equipment room.
- D. Coordinate location of power raceways and receptacles with locations of communications equipment requiring electrical power to operate.

3.2 GROUNDING

- A. Comply with NECA/BICSI 607.
- B. Install grounding according to BICSI ITSIMM, "Bonding, Grounding (Earthing) and Electrical Protection" Ch.
- C. Locate TGB to minimize length of bonding conductors. Fasten to wall, allowing at least 2 inches (50 mm) of clearance behind TGB. Connect TGB with a minimum No. 4 AWG grounding electrode conductor from TGB to suitable electrical building ground. Connect rack TGB to near TGB or the TMGB.
 - 1. Bond the shield of shielded cable to patch panel, and bond patch panel to TGB or TMGB.

3.3 IDENTIFICATION

- A. Coordinate system components, wiring, and cabling complying with TIA-606-B.
- B. Labels shall be machine printed. Type shall be 1/8 inch (3 mm) in height.

END OF SECTION 27 1116

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SECTION 27 1513 - COMMUNICATIONS COPPER HORIZONTAL CABLING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Category 6 twisted pair cable.
 - 2. Twisted pair cable hardware, including plugs and jacks.

1.2 COPPER HORIZONTAL CABLING DESCRIPTION

- A. The maximum allowable horizontal cable length is 295 feet (90 m). This maximum allowable length does not include an allowance for the length of 16 feet (4.9 m) to the workstation equipment or in the horizontal cross-connect.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.4 COORDINATION

- A. Coordinate layout and installation of telecommunications pathways and cabling with Owner's telecommunications and LAN equipment and service suppliers.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General Performance: Horizontal cabling system shall comply with transmission standards in TIA-568-C.1, when tested according to test procedures of this standard.
- B. Telecommunications Pathways and Spaces: Comply with TIA-569-D.
- C. Grounding: Comply with TIA-607-B.

2.2 GENERAL CABLE CHARACTERISTICS

- A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with the applicable standard and NFPA 70 for the following types:

1. Communications, Plenum Rated: Type CMP complying with UL 1685
 2. Communications, Plenum Rated: Type CM, Type CMG, Type CMP, Type CMR, or Type CMX in metallic conduit installed according to NFPA 70, Article 300.22, "Wiring in Ducts, Plenums, and Other Air-Handling Spaces."
 3. Communications, Non-plenum: Type CMR complying with UL 1666.
 4. Communications, Non-plenum: Type CMP or Type CMR in listed plenum or riser communications raceway.
 5. Communications, Non-plenum: Type CMP or Type CMR in metallic conduit installed according to NFPA 70, Article 300.22, "Wiring in Ducts, Plenums, and Other Air-Handling Spaces."
- B. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
1. Flame-Spread Index: 25 or less.
 2. Smoke-Developed Index: 50 or less.
- C. RoHS compliant.

2.3 CATEGORY 6 TWISTED PAIR CABLE

- A. Description: Four-pair, balanced-twisted pair cable, with internal spline, certified to meet transmission characteristics of Category 6 cable at frequencies up to 250MHz.
- B. Standard: Comply with NEMA WC 66/ICEA S-116-732 and TIA-568-C.2 for Category 6 cables.
- C. Conductors: 100-ohm, 23 AWG solid copper.
- D. Shielding/Screening: Unshielded twisted pairs (UTP) and Shielded twisted pairs (FTP).
- E. Jacket: Blue thermoplastic.

2.4 TWISTED PAIR CABLE HARDWARE

- A. Description: Hardware designed to connect, splice, and terminate twisted pair copper communications cable.
- B. General Requirements for Twisted Pair Cable Hardware:
1. Comply with the performance requirements of Category 6.
 2. Comply with TIA-568-C.2, IDC type, with modules designed for punch-down caps or tools.
 3. Cables shall be terminated with connecting hardware of same category or higher.
- C. Source Limitations: Obtain twisted pair cable hardware from single source from single manufacturer.
- D. Connecting Blocks:
1. 110-style IDC for Category 6.
 2. Provide blocks for the number of cables terminated on the block, plus 25 percent spare, integral with connector bodies, including plugs and jacks where indicated.

- E. Cross-Connect: Modular array of connecting blocks arranged to terminate building cables and permit interconnection between cables.
 - 1. Number of Terminals per Field: One for each conductor in assigned cables.
- F. Patch Panel: Modular panels housing numbered jack units with IDC-type connectors at each jack location for permanent termination of pair groups of installed cables.
 - 1. Features:
 - a. Universal T568A and T568B wiring labels.
 - b. Labeling areas adjacent to conductors.
 - c. Replaceable connectors.
 - d. 24 or 48 ports.
 - 2. Construction: 16-gauge steel and mountable on 19-inch (483 mm) equipment racks.
 - 3. Number of Jacks per Field: One for each four-pair cable indicated.
- G. Plugs and Plug Assemblies:
 - 1. Male; eight position; color-coded modular telecommunications connector designed for termination of a single four-pair, 100-ohm, unshielded or shielded twisted pair cable.
 - 2. Standard: Comply with TIA-568-C.2.
 - 3. Marked to indicate transmission performance.
- H. Jacks and Jack Assemblies:
 - 1. Female; eight position; modular; fixed telecommunications connector designed for termination of a single four-pair, 100-ohm, unshielded or shielded twisted pair cable.
 - 2. Designed to snap-in to a patch panel or faceplate.
 - 3. Standard: Comply with TIA-568-C.2.
 - 4. Marked to indicate transmission performance.
- I. Faceplate:
 - 1. Four port, vertical single gang faceplates designed to mount to single gang wall boxes.
 - 2. Plastic Faceplate: High-impact plastic. Coordinate color with Section 262726 "Wiring Devices."
 - 3. For use with snap-in jacks accommodating any combination of twisted pair, optical fiber, and coaxial work area cords.
- J. Legend:
 - 1. Machine printed, in the field, using adhesive-tape label.
 - 2. Snap-in, clear-label covers and machine-printed paper inserts.

PART 3 - EXECUTION

3.1 INSTALLATION OF TWISTED-PAIR HORIZONTAL CABLES

- A. Comply with NECA 1 and NECA/BICSI 568.

- B. Wiring Method: Install cables in raceways and cable trays, except within consoles, cabinets, desks, and counters and except in accessible ceiling spaces, attics, and gypsum board partitions where unenclosed wiring method may be used. Conceal raceway and cables, except in unfinished spaces.
- C. Wiring within Enclosures: Bundle, lace, and train cables within enclosures. Connect to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools. Install conductors parallel with or at right angles to sides and back of enclosure.
- D. General Requirements for Cabling:
 - 1. Comply with TIA-568-C.1.
 - 2. Comply with BICSI's Information Transport Systems Installation Methods Manual, Ch. 5, "Copper Structured Cabling Systems," "Cable Termination Practices" Section.
 - 3. Install 110-style IDC termination hardware unless otherwise indicated.
 - 4. Do not untwist twisted pair cables more than 1/2 inch (12 mm) from the point of termination to maintain cable geometry.
 - 5. Terminate all conductors; no cable shall contain unterminated elements. Make terminations only at indicated outlets, terminals, cross-connects, and patch panels.
 - 6. Cables may not be spliced. Secure and support cables at intervals not exceeding 30 inches (760 mm) and not more than 6 inches (150 mm) from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
 - 7. Install lacing bars to restrain cables, prevent straining connections, and prevent bending cables to smaller radii than minimums recommended by manufacturer.
 - 8. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI Information Transport Systems Installation Methods Manual, Ch. 5, "Copper Structured Cabling Systems," "Cable Termination Practices" Section. Use lacing bars and distribution spools.
 - 9. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation, and replace it with new cable.
 - 10. Cold-Weather Installation: Bring cable to room temperature before dereeling. Heat lamps shall not be used for heating.
 - 11. In the communications equipment room, install a 10-foot- (3-m-) long service loop on each end of cable.
 - 12. Pulling Cable: Comply with BICSI Information Transport Systems Installation Methods Manual, Ch. 5, "Copper Structured Cabling Systems," "Pulling and Installing Cable" Section. Monitor cable pull tensions.
- E. Group connecting hardware for cables into separate logical fields.
- F. Separation from EMI Sources:
 - 1. Comply with recommendations from BICSI's "Telecommunications Distribution Methods Manual" and TIA-569-D for separating unshielded copper communication cable from potential EMI sources, including electrical power lines and equipment.

3.2 GROUNDING

- A. Install grounding according to the "Grounding, Bonding, and Electrical Protection" chapter in BICSI's "Telecommunications Distribution Methods Manual."

- B. Comply with TIA-607-B and NECA/BICSI-607.
- C. Locate grounding bus bar to minimize the length of bonding conductors. Fasten to wall, allowing at least a 2-inch (50-mm) clearance behind the grounding bus bar. Connect grounding bus bar to suitable electrical building ground, using a minimum No. 4 AWG grounding electrode conductor.
- D. Bond metallic equipment to the grounding bus bar, using not smaller than a No. 6 AWG equipment grounding conductor.

3.3 IDENTIFICATION

- A. Identify system components, wiring, and cabling complying with TIA-606-B.
- B. Equipment grounding conductors.
- C. Cable and Wire Identification:
 - 1. Label each cable within 4 inches (100 mm) of each termination and tap, where it is accessible in a cabinet or junction or outlet box, and elsewhere as indicated.
 - 2. Each wire connected to building-mounted devices is not required to be numbered at the device if wire color is consistent with associated wire connected and numbered within panel or cabinet.
 - 3. Exposed Cables and Cables in Cable Trays and Wire Troughs: Label each cable at intervals not exceeding 15 feet (4.5 m).
 - 4. Label each terminal strip, and screw terminal in each cabinet, rack, or panel.
 - a. Individually number wiring conductors connected to terminal strips, and identify each cable or wiring group, extended from a panel or cabinet to a building-mounted device, with the name and number of a particular device.
 - b. Label each unit and field within distribution racks and frames.
 - 5. Identification within Connector Fields in Equipment Rooms and Wiring Closets: Label each connector and each discrete unit of cable-terminating and -connecting hardware. Where similar jacks and plugs are used for both voice and data communication cabling, use a different color for jacks and plugs of each service.
- D. Labels shall be preprinted or computer-printed type, with a printing area and font color that contrast with cable jacket color but still comply with TIA-606-B requirements for the following:
 - 1. Cables use flexible vinyl or polyester that flexes as cables are bent.

3.4 FIELD QUALITY CONTROL

- A. Tests and Inspections:
 - 1. Visually inspect jacket materials for NRTL certification markings. Inspect cabling terminations in communications equipment rooms for compliance with color-coding for pin assignments, and inspect cabling connections for compliance with TIA-568-C.1.
 - 2. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.

3. Test twisted pair cabling for DC loop resistance, shorts, opens, intermittent faults, and polarity between conductors. Test operation of shorting bars in connection blocks. Test cables after termination but not cross-connection.
- B. Data for each measurement shall be documented. Data for submittals shall be printed in a summary report that is formatted similarly to Table 10.1 in BICSI's "Telecommunications Distribution Methods Manual," or shall be transferred from the instrument to the computer, saved as text files, printed, and submitted.
- C. Remove and replace cabling where test results indicate that they do not comply with specified requirements.
- D. End-to-end cabling will be considered defective if it does not pass tests and inspections.
- E. Prepare test and inspection reports.

END OF SECTION 27 1513

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 28 4621 - ADDRESSABLE FIRE-ALARM SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Fire-alarm control unit.
 2. Manual fire-alarm boxes.
 3. Duct smoke detectors.
 4. Voice evacuation system.
 5. Notification appliances.
 6. Local operators console station.
 7. Addressable interface device.
 8. Digital alarm communicator transmitter.
 9. Cellular alarm communicator transmitter.
 10. Fire alarm cable and wire.

1.2 SCOPE OF WORK

- A. Replace existing fire alarm system with a new addressable fire alarm system with voice evacuation. Fire alarm audible signaling has to be upgraded from horns to voice evacuation. System shall be an Emergency Communication System "In-Building Fire Emergency Voice-Evacuation Communications System (EVACS) as per NFPA 72-2016 24.4.
1. Initiation cabling/wiring shall be replaced with new.
 2. Existing signal circuit cabling/wiring may be reused and reworked as necessary to new visible signal locations. Contractor will be required to repair any Code violations of existing signaling cabling that may exist.
 3. Audible (voice evacuation) cabling shall be new, throughout the building.
- B. The existing fire alarm system will have to remain operational while the new system is installed. Contractors option on how to approach the project as far as phasing.
- C. Provide remote system power supply extender panels in utility and storage rooms as necessary, with smoke detector at remote panel locations. Locations of these panels to be field coordinated with Owner prior to any rough-in.
- D. Reconnect all peripheral equipment, including kitchen hood, fire protection system monitoring and elevator recall controls.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product, including furnished options and accessories.
- B. Shop Drawings: For fire-alarm system.
 - 1. Comply with recommendations and requirements in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
 - 2. Include plans, elevations, sections, details, and attachments to other work.
 - 3. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and locations. Indicate conductor sizes, indicate termination locations and requirements, and distinguish between factory and field wiring.
 - 4. Detail assembly and support requirements.
 - 5. Include voltage drop calculations for notification-appliance circuits.
 - 6. Include battery-size calculations.
 - 7. Include input/output matrix.
 - 8. Include statement from manufacturer that all equipment and components have been tested as a system and meet all requirements in this Specification and in NFPA 72.
 - 9. Include performance parameters and installation details for each detector.
 - 10. Verify that each duct detector is listed for complete range of air velocity, temperature, and humidity possible when air-handling system is operating.
 - 11. Provide plan drawing indicating new equipment locations and locations of all new devices.
 - 12. Provide riser diagram with all equipment and devices to include addresses and system wiring specifications.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For fire-alarm systems and components to include in emergency, operation, and maintenance manuals.
 - 1. Provide the following "Operation and Maintenance Data":
 - a. Comply with the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
 - b. Provide "Fire Alarm and Emergency Communications System Record of Completion Documents" according to the "Completion Documents" Article in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
 - c. Complete wiring diagrams showing connections between all devices and equipment.
 - d. Plan drawings and riser diagram.
 - e. Record copy of site-specific software.
 - f. Provide "Inspection and Testing Form" according to the "Inspection, Testing and Maintenance" chapter in NFPA 72, and include the following:
 - 1) Equipment tested.
 - 2) Frequency of testing of installed components.
 - 3) Frequency of inspection of installed components.
 - 4) Requirements and recommendations related to results of maintenance.
 - 5) Manufacturer's user training manuals.
 - g. Manufacturer's required maintenance related to system warranty requirements.

- h. Abbreviated operating instructions for mounting at fire-alarm control unit and each annunciator unit.

B. Software and Firmware Operational Documentation:

- 1. Software operating and upgrade manuals.
- 2. Program Software Backup: On magnetic media or compact disk, complete with data files.
- 3. Device address list.
- 4. Printout of software application and graphic screens.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Personnel shall be trained and certified by manufacturer for installation of units required for this Project.

1.6 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace fire-alarm system equipment and components that fail in materials or workmanship within specified warranty period.
- 1. Warranty Extent: All equipment and components not covered in the Maintenance Service Agreement.
 - 2. Warranty Period: One year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. Source Limitations for Fire-Alarm System and Components: Provide system manufacturer's certification that all components provided have been tested as, and will operate as, a system.
- B. Noncoded, UL-certified addressable system, with multiplexed signal transmission and horn/strobe evacuation.
- C. Fire-alarm control unit shall utilize non-proprietary software. System shall be able to be programmed by trained technicians but not have to be manufacturer's personnel. Programming shall be able to be accomplished by electricians or technicians not associated with the manufacturer.
- D. All components provided shall be listed for use with the selected system.
- E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 SYSTEMS OPERATIONAL DESCRIPTION

- A. Fire-alarm signal initiation shall be by one or more of the following devices and systems:

1. Manual stations.
2. Heat detectors.
3. Smoke detectors.
4. Duct smoke detectors.
5. Automatic sprinkler system water flow.
6. Fire-extinguishing system operation.

B. Fire-alarm signal shall initiate the following actions:

1. Continuously operate alarm notification appliances.
2. Identify alarm and specific initiating device at fire-alarm control unit.
3. Transmit an alarm signal to the remote alarm receiving station via digital dialer.
4. Release fire and smoke doors held open by magnetic door holders.
5. Recall elevators to primary or alternate recall floors.
6. Record events in the system memory.

C. EVACS operation:

1. Upon alarm operation of the fire detection system (and its appropriate resulting actions and zone annunciation) the voice alarm system shall:
 - a. Light the red Evacuation LED's at the amplifier units.
 - b. Cause the alarm speaker devices to sound the Evacuation Tone throughout the covered areas of the building until silenced.
2. The audible speaker appliances shall continue to sound during alarm until manually or automatically silenced. The manual silencing shall be delayed during the first minute of alarm. The automatic silencing shall be set to "infinite" (i.e. signal appliances will NOT silence automatically) unless specified otherwise.
3. Silencing of signals shall cause the amplifier's red Evacuation LED's to extinguish. A subsequent alarm shall cause all speaker devices to sound again.
4. The system operator shall be able to page to the audible speaker devices by simply keying the microphone and by also selecting either "all-call" (to page to all speaker zones) or one or more zone select switches at the paging selector panel (to page to particular zones). This operation shall be inhibited during the first minute of alarm. While paging, the Evacuation Alarm Tone shall be suppressed only on those zones receiving the page announcement. The "mic level" indicator on the microphone shall flash in response to the voice paging level. When page is completed, the Evacuation Tone shall return to the appropriate speaker zones unless previously silenced. There shall also be provision for "all-call minus" paging; allowing the operator to page all zones not currently manually selected.
5. The alarm condition shall be cleared only upon reset of the fire detection system.
6. Activation of a remote firefighter's handset (i.e. handset taken off hook) shall cause a call-in buzzer to sound at the master handset module. If the system is not zoned, the common of the incoming select switch shall put the operator in communication with the field handset user. If the system is zoned, the appropriate zone LED shall flash at the selector panel; operation of the corresponding zone switch shall establish communication. In this manner, up to six remote handsets in total may be connected to the master at one time. There shall also be provision for "warden page" operation; allowing the field or master handset operator to use the telephone handset system as the "paging microphone" for the voice page system.
7. An audio system trouble condition shall:

- a. Light the amber common trouble indicator at the QIF-5000 interface card and at the microphone panel and sound the system trouble buzzer.
 - b. Cause the audio trouble condition to annunciate at the fire detection panel.
 8. Depending upon the nature of the trouble, cause the appropriate additional trouble indicators to light as described below:
 - a. Open circuit fault in the field wiring of a speaker zone or a short on a speaker zone: appropriate amplifier circuit indicator and "circuit trouble" indicator on microphone.
 - b. Failure of a supervised component of the amplifier: appropriate amplifier fault indicator and "amplifier trouble" indicator on microphone.
 - c. Disconnection or failure of the battery pack(s): battery trouble indicator at the interface card.
 - d. A ground condition on a field wire: ground fault indicator at the interface card.
 - e. Failure of the main 120vac power: extinguish the green AC power indicators.
 - f. A fault on the paging microphone or its wiring: Mic trouble indicator at microphone panel.
 - g. An internal fault of the pre-amp: Pre-amp Trouble indicator.
 - h. An internal tone generator fault: Tone Generator Trouble indicator.
 - i. Open or short on communication lines between microphone panel and Voice Evacuation Control Panel: Remote failure indicator at microphone panel.
 9. A firefighter's handset system trouble shall cause:
 - a. A "telephone system trouble" to annunciate at the fire detection panel.
 - b. The "common telephone trouble" indicator to light at the master handset if the trouble is field wiring related.
 - c. The "master telephone trouble" indicator to light at the master handset if the trouble is related to an internal fault.
 - d. The appropriate zone trouble indicator to light if the fault is related to the field wiring of a zoned handset circuit.
 10. The trouble buzzer shall be silenced by operation of the buzzer silence switch on the microphone panel. The trouble conditions shall clear from the system when the cause is rectified.
 11. Control Switches:
 - a. Buzzer silence---- Silences trouble buzzer.
 - b. Lamp test ---- Tests operation of related LED indicators.
 - c. All-call --- Allows microphone paging to all speaker circuits.
 - d. All-call minus --- In a zoned voice system, allows paging to all speaker zones not currently selected for paging.
 - e. Warden page --- Allows use of the handset system as a paging source.
 - f. Page switches --- In a zoned voice system, allow selection of individual speaker zones for page.
 - g. Incoming call --- Connects incoming handset call to master handset in a non-zoned system.
 - h. Telephone Switches --- Connects incoming handset call to master handset in a zoned system.
- D. Supervisory signal initiation shall be by one or more of the following devices and actions:
1. Valve supervisory switch.
 2. Loss of communication with any panel on the network.

- E. System trouble signal initiation shall be by one or more of the following devices and actions:
1. Open circuits, shorts, and grounds in designated circuits.
 2. Opening, tampering with, or removing alarm-initiating and supervisory signal-initiating devices.
 3. Loss of communication with any addressable sensor, input module, relay, control module, or remote annunciator.
 4. Loss of primary power at fire-alarm control unit.
 5. Ground or a single break in internal circuits of fire-alarm control unit.
 6. Abnormal ac voltage at fire-alarm control unit.
 7. Break in standby battery circuitry.
 8. Failure of battery charging.
 9. Abnormal position of any switch at fire-alarm control unit or annunciator.
- F. System Supervisory Signal Actions:
1. Initiate notification appliances.
 2. Identify specific device initiating the event at fire-alarm control unit.
 3. After a time delay of 200 seconds, transmit a trouble or supervisory signal to the remote alarm receiving station.

2.3 FIRE-ALARM CONTROL UNIT

- 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. Bosch Security Systems, Inc.
 2. Edwards; Carrier Global Corporation.
 3. Fike Corporation.
 4. Fire-Lite Alarms; Honeywell International, Inc.
 5. Gamewell-FCI; Honeywell International, Inc.
 6. Mircom Technologies, Ltd.
 7. Notifier; Honeywell International, Inc.
 8. Siemens Industry, Inc., Building Technologies Division.
 9. Silent Knight; Honeywell International, Inc.
- B. Description: Field-programmable, microprocessor-based, modular, power-limited design with electronic modules.
- C. General Requirements for Fire-Alarm Control Unit:
1. Field-programmable, microprocessor-based, modular, power-limited design with electronic modules, complying with UL 864.
 2. Fire-alarm control unit shall utilize non-proprietary software. System shall be able to be programmed by trained technicians but not have to be manufacturer's personnel. Programming shall be able to be accomplished by electricians or technicians not associated with the manufacturer.
 3. Addressable Initiation Device Circuits: The FACP shall indicate which communication zones have been silenced and shall provide selective silencing of alarm notification appliance by building communication zone.
 4. Addressable Control Circuits for Operation of Notification Appliances and Mechanical Equipment: The FACP shall be listed for releasing service.

- D. Alphanumeric Display and System Controls: Arranged for interface between human operator at fire-alarm control unit and addressable system components including annunciation and supervision. Display alarm, supervisory, and component status messages and the programming and control menu.
 - 1. Annunciator and Display: Liquid-crystal type, 80 characters, minimum.
 - 2. Keypad: Arranged to permit entry and execution of programming, display, and control commands.
- E. Initiating-Device, Notification-Appliance, and Signaling-Line Circuits:
 - 1. Pathway Class Designations: NFPA 72, Class B.
 - 2. Pathway Survivability: Level 1.
- F. Notification-Appliance Circuit:
 - 1. The emergency voice/audio tone system shall include, but not be limited to, a voice system consisting of system cabinets, audio amplifiers, audio interface and control, audio system power supply and batteries, microphone assembly, paging circuit selector switches, speaker signaling devices, and miscellaneous peripheral devices that may be required. The audio system shall integrate fully with a Fire detection system to provide a fully functional, fire detection/single stage, dual channel voice and tone alarm system. The system shall enable the operator to perform paging from a centralized microphone to speaker devices on by circuit or "all-call" basis; these same speakers will also be used to transmit a fire alarm evacuation signal. The system and all associated equipment shall be fully approved and listed by both Underwriter's Laboratories (UL) and Underwriter's Laboratories Canada (ULC).
 - 2. Visual alarm appliances shall flash in synchronization where multiple appliances are in the same field of view, as defined in NFPA 72.
- G. Elevator Recall:
 - 1. Elevator recall shall be initiated only by one of the following alarm-initiating devices:
 - a. Elevator lobby detectors except the lobby detector on the designated floor.
 - b. Smoke detector in elevator machine room.
 - c. Smoke detectors in elevator hoistway.
 - 2. Elevator controller shall be programmed to move the cars to the alternate recall floor if lobby detectors located on the designated recall floors are activated.
 - 3. Water-flow alarm connected to sprinkler in an elevator shaft and elevator machine room shall shut down elevators associated with the location without time delay.
 - a. Water-flow switch associated with the sprinkler in the elevator pit may have a delay to allow elevators to move to the designated floor.
- H. Door Controls: Door hold-open devices that are controlled by smoke detectors at doors in smoke-barrier walls shall be connected to fire-alarm system.
- I. Primary Power: 24-V dc obtained from 120-V ac service and a power-supply module. Initiating devices, notification appliances, signaling lines, trouble signals, supervisory signals, supervisory and digital alarm communicator transmitters and digital alarm radio transmitters shall be powered by 24-V dc source.

1. Alarm current draw of entire fire-alarm system shall not exceed 80 percent of the power-supply module rating.
- J. Secondary Power: 24-V dc supply system with batteries, automatic battery charger, and automatic transfer switch.

2.4 MANUAL FIRE-ALARM BOXES

- A. General Requirements for Manual Fire-Alarm Boxes: Comply with UL 38.
 1. Dual-action mechanism, pull-lever]type; with integral addressable module arranged to communicate manual-station status (normal, alarm, or trouble) to fire-alarm control unit.
 2. Station Reset: Key- or wrench-operated switch.

2.5 SYSTEM SMOKE DETECTORS

- A. General Requirements for System Smoke Detectors:
 1. Comply with UL 268; operating at 24-V dc, nominal.
 2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.
 3. Base Mounting: Detector and associated electronic components shall be mounted in a twist-lock module that connects to a fixed base. Provide terminals in the fixed base for connection to building wiring.
 4. Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore them to normal operation.
 5. Integral Visual-Indicating Light: LED type, indicating detector has operated.
- B. Photoelectric Smoke Detectors:
 1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
 2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
 - a. Primary status.
 - b. Device type.
 - c. Present average value.
 - d. Present sensitivity selected.
 - e. Sensor range (normal, dirty, etc.).
- C. Duct Smoke Detectors: Photoelectric type complying with UL 268A.
 1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
 2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
 - a. Primary status.
 - b. Device type.

- c. Present average value.
 - d. Present sensitivity selected.
 - e. Sensor range (normal, dirty, etc.).
- 3. Each sensor shall have multiple levels of detection sensitivity.
 - 4. Sampling Tubes: Design and dimensions as recommended by manufacturer for specific duct size, air velocity, and installation conditions where applied.
 - 5. Relay Fan Shutdown: Fully programmable relay rated to interrupt fan motor-control circuit.

2.6 CARBON MONOXIDE DETECTORS

- A. General: Carbon monoxide detector listed for connection to fire-alarm system.
 - 1. Mounting: Adapter plate for outlet box mounting.
 - 2. Testable by introducing test carbon monoxide into the sensing cell.
 - 3. Detector shall provide alarm contacts and trouble contacts.
 - 4. Detector shall send trouble alarm when nearing end-of-life, power supply problems, or internal faults.
 - 5. Comply with UL 2075.
 - 6. Locate, mount, and wire according to manufacturer's written instructions.
 - 7. Provide means for addressable connection to fire-alarm system.
 - 8. Test button simulates an alarm condition.

2.7 NOTIFICATION APPLIANCES

- A. General Requirements for Notification Appliances: Connected to notification-appliance signal circuits, zoned as indicated, equipped for mounting as indicated, and with screw terminals for system connections.
 - 1. Combination Devices: Factory-integrated audible and visible devices in a single-mounting assembly, equipped for mounting as indicated, and with screw terminals for system connections.
- B. Speakers for voice evacuation audible signals.
- C. Visible Notification Appliances: Xenon strobe lights complying with UL 1971, with clear or nominal white polycarbonate lens mounted on an aluminum faceplate. The word "FIRE" is engraved in minimum 1-inch- (25-mm-) high letters on the lens.
 - 1. Mounting: Wall mounted unless otherwise indicated.
 - 2. Flashing shall be in a temporal pattern, synchronized with other units.
 - 3. Strobe Leads: Factory connected to screw terminals.
 - 4. Mounting Faceplate: Factory finished, red.

2.8 ADDRESSABLE INTERFACE DEVICE

- A. General:
 - 1. Include address-setting means on the module.
 - 2. Store an internal identifying code for control panel use to identify the module type.
 - 3. Listed for controlling HVAC fan motor controllers.

- B. Monitor Module: Microelectronic module providing a system address for alarm-initiating devices for wired applications with normally open contacts.
- C. Integral Relay: Capable of providing a direct signal to elevator controller to initiate elevator recall.
 - 1. Allow the control panel to switch the relay contacts on command.
 - 2. Have a minimum of two normally open and two normally closed contacts available for field wiring.

2.9 DIGITAL ALARM COMMUNICATOR TRANSMITTERS (DACTs)

- A. Performance Criteria:
 - 1. Regulatory Requirements:
 - a. NFPA 72.
 - 2. General Characteristics:
 - a. DACT must be acceptable to remote central station and must be listed for fire-alarm use.
 - b. Functional Performance: Unit must receive alarm, supervisory, or trouble signal from FACU and automatically capture two telephone line(s) and dial preset number for remote central station. When contact is made with central station(s), signals must be transmitted. If service on either line is interrupted for longer than 45 seconds, transmitter must initiate local trouble signal and transmit signal indicating loss of telephone line to remote alarm receiving station over remaining line. Transmitter must automatically report telephone service restoration to central station. If service is lost on both telephone lines, transmitter must initiate local trouble signal.
 - c. Local functions and display at DACT must include the following:
 - 1) Verification that both telephone lines are available.
 - 2) Programming device.
 - 3) LED display.
 - 4) Manual test report function and manual transmission clear indication.
 - 5) Communications failure with central station or FACU.
 - d. Digital data transmission must include the following:
 - 1) Address of alarm-initiating device.
 - 2) Address of supervisory signal.
 - 3) Address of trouble-initiating device.
 - 4) Loss of ac supply.
 - 5) Loss of power.
 - 6) Low battery.
 - 7) Abnormal test signal.
 - 8) Communication bus failure.
 - e. Self-Test: Conducted automatically every 24 hours with report transmitted to central station.

2.10 CELLULAR ALARM COMMUNICATOR TRANSMITTER

- A. Cellular alarm communicator transmitter shall be acceptable to the remote central station and shall comply with UL S3511.
- B. Functional Performance: Unit shall receive an alarm, supervisory, or trouble signal from fire-alarm control unit and automatically send signal via cellular connection to a central station. When contact is made with central station(s), signals shall be transmitted. If service on either line is interrupted for longer than 45 seconds, transmitter shall initiate a local trouble signal and transmit the signal indicating loss of telephone line to the remote alarm receiving station over the remaining line. Transmitter shall automatically report telephone service restoration to the central station. If service is lost on both telephone lines, transmitter shall initiate the local trouble signal.
- C. Local functions and display at the digital alarm communicator transmitter shall include the following:
 - 1. Verification that both telephone lines are available.
 - 2. Programming device.
 - 3. LED display.
 - 4. Manual test report function and manual transmission clear indication.
 - 5. Communications failure with the central station or fire-alarm control unit.
- D. Digital data transmission shall include the following:
 - 1. Address of the alarm-initiating device.
 - 2. Address of the supervisory signal.
 - 3. Address of the trouble-initiating device.
 - 4. Loss of ac supply.
 - 5. Loss of power.
 - 6. Low battery.
 - 7. Abnormal test signal.
 - 8. Communication bus failure.
- E. Secondary Power: Integral rechargeable battery and automatic charger.
- F. Self-Test: Conducted automatically every 24 hours with report transmitted to central station.

2.11 FIRE ALARM WIRE AND CABLE

- A. General Wire and Cable Requirements: NRTL listed and labeled as complying with NFPA 70, Article 760.
- B. Signaling Line Circuits: Twisted, shielded pair, size as recommended by system manufacturer and identified in the approved submittal package.
- C. Non-Power-Limited Circuits: Solid-copper conductors with 600-V rated, 75 deg C, color-coded insulation, and complying with requirements in UL 2196 for a two-hour rating.
 - 1. Low-Voltage Circuits: No. 16 AWG, minimum, in pathway.
 - 2. Line-Voltage Circuits: No. 12 AWG, minimum, in pathway.
 - 3. Multi-conductor Armored Cable: NFPA 70, Type MC, copper conductors, Type TFN/THHN conductor insulation, copper drain wire, copper armor with outer jacket with red identifier stripe, NRTL listed for fire alarm and cable tray installation, plenum rated.

PART 3 - EXECUTION

3.1 EQUIPMENT INSTALLATION

- A. Comply with NFPA 72, NFPA 101, and requirements of authorities having jurisdiction for installation and testing of fire-alarm equipment. Install all electrical wiring to comply with requirements in NFPA 70 including, but not limited to, Article 760, "Fire Alarm Systems."
- B. Connecting to Existing Equipment: Verify that existing fire-alarm system is operational before making changes or connections.
- C. Install wall-mounted equipment, with tops of cabinets not more than 78 inches (1980 mm) above the finished floor.
- D. Manual Fire-Alarm Boxes:
 - 1. Install manual fire-alarm box in the normal path of egress within 60 inches (1520 mm) of the exit doorway.
 - 2. Mount manual fire-alarm box on a background of a contrasting color.
 - 3. The operable part of manual fire-alarm box shall be between 42 inches (1060 mm) and 48 inches (1220 mm) above floor level. All devices shall be mounted at the same height unless otherwise indicated.
- E. Duct Smoke Detectors: Comply with NFPA 72 and NFPA 90A. Install sampling tubes so they extend the full width of duct. Tubes more than 36 inches (9100 mm) long shall be supported at both ends.
- F. Audible Alarm-Indicating Devices: Install flush in ceilings on boxes with T-grid bars, or surface mount to exposed building structure.
- G. Visible Alarm-Indicating Devices: Install flush in ceilings on boxes with T-grid bars.

3.2 PATHWAYS

- A. Pathways above recessed ceilings and in nonaccessible locations may be routed exposed.
- B. Pathways shall be installed in EMT.
- C. All junction boxes shall have red painted covers.
- D. Refer to general notes on plan drawings for wiring requirements.

3.3 CONNECTIONS

- A. Make addressable connections with a supervised interface device to the following devices and systems. Install the interface device less than 36 inches (910 mm) from the device controlled. Make an addressable confirmation connection when such feedback is available at the device or system being controlled.

3.4 IDENTIFICATION

- A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 26 0553 "Identification for Electrical Systems."
- B. Provide documentation box with all system documentation and required by NFPA 72.

3.5 GROUNDING

- A. Ground fire-alarm control unit and associated circuits; comply with IEEE 1100. Install a ground wire from main service ground to fire-alarm control unit.
- B. Ground shielded cables at the control panel location only. Insulate shield at device location.

3.6 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. Visual Inspection: Conduct visual inspection prior to testing.
 - a. Inspection shall be based on completed record Drawings and system documentation that is required by NFPA 72 in its "Completion Documents, Preparation" table in the "Documentation" section of the "Fundamentals" chapter.
 - b. Comply with the "Visual Inspection Frequencies" table in the "Inspection" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72; retain the "Initial/Reacceptance" column and list only the installed components.
 - 2. System Testing: Comply with the "Test Methods" table in the "Testing" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
 - 3. Test audible appliances for the public operating mode according to manufacturer's written instructions. Perform the test using a portable sound-level meter complying with Type 2 requirements in ANSI S1.4.
 - 4. Test audible appliances for the private operating mode according to manufacturer's written instructions.
 - 5. Test visible appliances for the public operating mode according to manufacturer's written instructions.
 - 6. Factory-authorized service representative shall prepare the "Fire Alarm System Record of Completion" in the "Documentation" section of the "Fundamentals" chapter in NFPA 72 and the "Inspection and Testing Form" in the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
- B. Reacceptance Testing: Perform reacceptance testing to verify the proper operation of added or replaced devices and appliances.
- C. Fire-alarm system will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.
- E. Maintenance Test and Inspection: Perform tests and inspections listed for weekly, monthly, quarterly, and semiannual periods. Use forms developed for initial tests and inspections.

- F. Annual Test and Inspection: One year after date of Substantial Completion, test fire-alarm system complying with visual and testing inspection requirements in NFPA 72. Use forms developed for initial tests and inspections.

3.7 SOFTWARE SERVICE AGREEMENT

- A. Comply with UL 864.
- B. Technical Support: Beginning at Substantial Completion, service agreement shall include software support for one year.

3.8 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain fire-alarm system.

END OF SECTION 28 4621

This specification section is only part of the complete project contract documents. It is the responsibility of the Construction Manager / General Contractor / Sub-Contractor to ensure co-ordination of this section with the scope of works for the project in its entirety. The work carried out, and all the materials used, within this Section shall comply with all industry codes and standards.

SECTION 32 33 13

SITE BICYCLE RACKS

1. PART 1 GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Exterior bicycle racks.

1.2. REFERENCE STANDARDS

- 1.2.1. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- 1.2.2. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 2025.
- 1.2.3. ASTM A312/A312M - Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes; 2025.
- 1.2.4. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2023.
- 1.2.5. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2025.
- 1.2.6. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.
- 1.2.7. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2024a.
- 1.2.8. ASTM C150/C150M - Standard Specification for Portland Cement; 2024.
- 1.2.9. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2024.
- 1.2.10. ASTM C330/C330M - Standard Specification for Lightweight Aggregates for Structural Concrete; 2023.

1.3. SUBMITTALS

- 1.3.1. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- 1.3.2. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1.3.2.1. Preparation instructions and recommendations.
 - 1.3.2.2. Storage and handling requirements and recommendations.
 - 1.3.2.3. Installation methods.
- 1.3.3. Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and patterns.

1.4. DELIVERY, STORAGE, AND HANDLING

- 1.4.1. Store products in manufacturer's unopened packaging until ready for installation.
- 1.4.2. Handle racks with sufficient care to prevent scratches and other damage to the finish.

2. PART 2 PRODUCTS

2.1. MANUFACTURERS

- 2.1.1. Exterior Bicycle Racks:
 - 2.1.1.1. American Bicycle Security Company: www.ameribike.com/#sle.
 - 2.1.1.2. Any product equal and approved.

2.1.1.3. Substitutions: See Section 01 60 00 - Product Requirements.

2.2. BICYCLE RACKS

- 2.2.1. Exterior Bicycle Racks: Device allows user-provided lock to simultaneously secure one wheel and part of the frame on each bicycle parked or racked.
 - 2.2.1.1. Style: Round loop.
 - 2.2.1.2. Capacity: Nine bicycles.
 - 2.2.1.3. Mounting, Ground: Freestanding.
 - 2.2.1.4. Finish: Powder coat, maintenance-free and weather-resistant.
 - 2.2.1.5. Color: As selected by Alba Architects from manufacturer's standard range.
 - 2.2.1.6. Accessories: In-ground grout cover.
- 2.2.2. Materials:

3. PART 3 EXECUTION

3.1. EXAMINATION

- 3.1.1. Examine surfaces to receive bicycle racks.
- 3.1.2. If substrate preparation is the responsibility of another installer, notify Alba Architects of unsatisfactory conditions before proceeding.
- 3.1.3. Do not begin installation until unsatisfactory conditions are corrected.

3.2. PREPARATION

- 3.2.1. Ensure surfaces to receive bicycle racks are clean, flat, and level.

3.3. INSTALLATION

- 3.3.1. Install in accordance with manufacturer's instructions.
- 3.3.2. Install level, plumb, square, and correctly located as indicated on drawings.
- 3.3.3. Freestanding Installation: Place in location indicated on drawings.

3.4. CLEANING

- 3.4.1. Clean installed work to like-new condition. Do not use cleaning materials or methods that could damage finish.

3.5. PROTECTION

- 3.5.1. Protect installed products until completion of project.
- 3.5.2. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION