

**Project Specifications
For**

***SAMUEL MAHELONA
MEMORIAL HOSPITAL***

***Emergency Department
Renovation & Addition***

Construction Documents/Bid Set

**Kauai, Hawaii
Project No. 225057-01**

27 February 2026



TABLE OF CONTENTS

SPECIFICATIONS

BID FORM

DIVISION	01	GENERAL REQUIREMENTS
	01010	Summary of Work
	01035	Modification Procedures
	01040	Coordination
	01045	Cutting and Patching
	01046	Request for Information
	01090	References
	01210	Allowances
	01270	Variable Quantities Unit Prices
	01330	Submittal Procedures
	01450	Quality Control
	01500	Temporary Facilities and Controls
	01570	Soil Protection and Erosion Control
	01595	Project Cleaning
	01600	Material and Equipment
	01630	Product Options and Substitutions
	01720	Project Record Documents
	01770	Closeout Procedures
DIVISION	02	SITE WORK
	02070	Selective Demolition
	02100	Site Preparation
	02221	Building Demolition
	02282	Under Slab Vapor and Termite Barrier
	02300	Earthwork
	02302	Trenching, Excavation, and Backfill for Utilities
	02520	Paving, Roadway, and Miscellaneous Work
	02630	Storm Drainage
	02740	Asphalt Concrete Paving
	02760	Pavement Marking and Signage
	02810	Irrigation System
	02900	Planting
	02906	Tree Planting
DIVISION	03	CONCRETE
	03300	Cast-In-Place Concrete
DIVISION	04	MASONRY
	04860	Simulated Stone Veneer
DIVISION	05	METALS

February 27, 2026

05120	Structural Steel
05140	Aluminum Equipment Screens
05310	Steel Deck
05720	Guardrails and Handrails

DIVISION	06	WOOD AND PLASTICS
06070		Wood Treatment
06100		Rough Carpentry
06160		Exterior Gypsum Sheathing
06200		Finish Carpentry
06412		Architectural Casework
06620		Solid Surface Countertops

DIVISION	07	THERMAL AND MOISTURE PROTECTION
07130		Elastomeric Sheet Membrane Waterproofing
07180		Traffic Coatings
07210		Building Insulation
07241		Direct Applied Exterior Finish System
07250		Fluid Applied Air and Water Resistive Barriers
07270		Penetration Firestopping
07410		Standing Seam Metal Roof
07421		Decorative Extruded Aluminum Batten Wall Panels
07460		Aluminum Composite Wall Panels
07540		TPO Membrane
07600		Flashing and Sheet Metal
07811		Sprayed Fire Resistive Material
07910		Exterior Wall Joint Sealants
07920		Sealants
07950		Exterior Expansion Joint Control Assemblies

DIVISION	08	DOORS AND WINDOWS
08110		Steel Doors & Frames
08210		Wood Doors
08305		Access Doors
08330		Overhead Coiling Doors
08340		Behavioral Health Doors and Frames
08341		Sliding Door Opening Assemblies
08460		Sliding Automatic Entrance Doors
08520		Glazed Aluminum Systems
08584		Security Windows
08710		Finish Hardware
08800		Glazing
08830		Mirrors

DIVISION	09	FINISHES
09250		Gypsum Board Assemblies
09310		Ceramic Tile
09340		Tile Waterproofing
09510		Suspended Acoustical Ceilings

February 27, 2026

09545	Suspended Wood Ceilings
09651	Resilient Flooring
09680	Carpeting
09900	Painting
09905	High Performance Wall Coatings

DIVISION	10	SPECIALTIES
10212		Cubicle Track and Curtain
10251		Patient Bed Service Walls
10265		Impact-Resistant Wall Protection
10416		Directories and Bulletin Boards
10520		Fire Extinguishers and Cabinets
10800		Toilet Accessories

DIVISION	11	EQUIPMENT - NOT USED

DIVISION	12	FURNISHINGS
12494		Roller Shades

DIVISION	13	SPECIAL CONSTRUCTION
13851		Addressable Fire Alarm System

DIVISION	14	CONVEYING SYSTEMS - NOT USED

DIVISION	15	MECHANICAL
15011		General Mechanical Provisions
15400		Plumbing
15410		Plumbing Fixtures
15600		Air Conditioning and Ventilation

DIVISION	16	ELECTRICAL
16011		General Electrical Requirements
16100		Electrical Work
16510		Lighting
16711		Pathways for Communications
16717		Communication Horizontal Cabling

END OF TABLE OF CONTENTS

BID FORM

FOR

FURNISHING LABOR, MATERIALS, EQUIPMENT AND OTHER TOOLS

REQUIRED FOR

SAMUEL MAHELONA MEMORIAL HOSPITAL

EMERGENCY
DEPARTMENT ADDITION
AND RENOVATION

RFP NO. _____

TAX MAP KEY: 4-6-014:113

KAPA`A, KAUAI, HAWAII

FOR THE
HAWAII HEALTH SYSTEMS CORPORATION
STATE OF HAWAII

After carefully examining the bid documents identified above, the Offeror proposes to furnish at its own expenses all necessary labor, materials, tools and equipment to complete the work according to the true intent and meaning of the drawings and specifications, all for the Lump Sum Base Bid of:

_____ DOLLARS (\$ _____)
(Bid Breakdown shall be submitted in bid by Specification Division No.)

Submitted By:

Signature / Printed Name_____
Date_____
Title

(Name of Business) is a:

☐ Sole Proprietor ☐ Partnership ☐ Corporation ☐ Joint Venture ☐ Other (Specify) _____

Business Address: _____

Business Phone Number: _____

E-mail address: _____

Federal TAX ID #: _____

Hawaii GET Lic ID #: _____

State of Incorporation is: (Specify) _____

The exact legal name of the business under which the contract, if awarded, shall be executed is:___

RECEIPT OF ADDENDA

Receipt of the following addenda issued by the HHSC is acknowledged by the date(s) of receipt indicated below:

Addendum No. 1 _____

Addendum No. 4 _____

Addendum No. 2 _____

Addendum No. 5 _____

Addendum No. 3 _____

Addendum No. 6 _____

It is understood that failure to receive any such addendum shall not relieve the Bidder from any obligations under this Proposal as submitted.

BID BREAKDOWN**Project: SMMH Emergency Department Renovation and Addition****Company Name:****By:**

	Bid	Subs	Remarks/Comments
Division 00			
Division 01 - General Requirements			
Division 02 - Sitework			
Division 03 - Concrete			
Division 04 - Masonry			
Division 05 - Metals			
Division 06 - Wood and Plastics			
Division 07 - Thermal and Moisture Protection			
Division 08 - Doors and Windows			
Division 09 - Finishes			
Division 10 - Specialties			
Division 11 - Equipment	Not Used		
Division 12 - Furnishings			
Division 13 - Special Construction			
Division 14 - Conveying Systems	Not Used		
Division 15 - Mechanical			
Division 16 - Electrical			
Total Cost of Work			
Permit Fee			
Performance Bond			
Liability Insurance			
General Excise Tax			
Markup			
Allowance – Hazardous Materials	\$39,000.00		
TOTAL BID			

Contractor shall provide unit prices for the following items. Unit prices shall include all labor, supervision, equipment, containment, protection of adjacent occupied areas, air monitoring coordination, disposal, transportation, overhead, profit, and all incidentals necessary for complete work. Unit prices shall remain valid for the duration of the Contract.

	Unit	Unit Price	Remarks/Comments
Hazardous Materials - ACM	SF		
Hazardous Materials - LEAD-BASED PAINT	SF		
Hazardous Materials - Testing & Clearance	DAY		

Change Order OH & Profit (%) _____

VE/Cost Saving Suggestion _____

Details:

DIVISION 01 – GENERAL REQUIREMENTS

SECTION 01010 – SUMMARY OF WORK

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. General description of the Project.
 - 2. General requirements for the Project.
- B. Related Sections:
 - 1. Division 01 Sections.

1.02 PROJECT/WORK SUMMARY

- A. Project Summary: The Work consists of but is not limited to the following:
 - 1. Demolition summary is as specified in Section 02070 – SELECTIVE DEMOLITION
 - 2. New construction as indicated on the drawings.
- B. Contract Documents:
 - 1. List of Documents: All of the following documents apply to the Contract.
 - a. Drawings:
 - i. Bound hardcopy set of G70 and their consultants bound therein.
 - b. Project Manual:
 - i. Bound hardcopy set of “Project Manual” of G70 and their Consultants bound therein.
 - c. Other: As included in listing of Contract between Owner and Contractor.
 - d. Available Informative Documents, Reports and Data, not part of the Contract Documents can be made available by Owner as requested.
 - 2. Data Availability:
 - a. Availability: All documents which impact the Project are available from the Owner.
 - b. Contractor Responsibility: Full review of all Contract requirements is Contractor’s responsibility.

1.03 OWNER FURNISHED PRODUCTS

- A. Owner Furnished Contractor Installed (OF CI)
 - 1. Products furnished to the site and paid for by Owner. Installation and final connection are by Contractor.

2. Owner's Responsibilities:

- a. Arrange for and deliver Owner reviewed shop drawings, product data, and samples, to Contractor. Require vendor to indicate on shop drawings necessary blocking for attachment.
- b. Arrange and pay for product delivery to site.
- c. On delivery, inspect products jointly with Contractor.
- d. Submit claims for transportation damage. Replace damaged, defective or deficient items.
- e. Arrange for manufacturers' warranties, inspections and service.

3. Contractor's Responsibilities:

- a. Designate required submittal date for shop drawings, product data and samples.
- b. Designate required delivery date for each product.
- c. Review Owner-reviewed shop drawings, product data, and samples.
- d. Receive and unload products at site. Inspect products jointly with Owner.
- e. Handle, store and protect products from loss and damage.
- f. Coordinate installation and protect installed and finished products.
- g. Repair or replace items damaged after receipt.
- h. Remove packing debris from site.

1.04 CONTRACT DOCUMENTS

- A. Contract Documents Language: Imperative language is intended. Except as otherwise indicated, written requirements are to be executed by the Contractor.
- B. Related Provisions: The following applies to all Work specified and is to be provided to all Entities; whether directly or indirectly involved in the Work.
 1. Conditions of the Contract.
 2. Contract Drawings.
 3. Division 01 Specification Sections.
 4. As applicable to each Entity, the appropriate Specification Section(s) and related Specification Section(s) of other Installers.
 5. As applicable to each Entity, modifications to the Contract, if any.

1.05 QUALITY ASSURANCE

- A. Standards of Quality: The highest quality of work is to be provided as necessary to comply with all of following.

1. Contract requirements: unless in conflict with Code or other Authority requirements, then such requirements take precedence, but conflicting requirements are to be resolved in accordance with Architect's directives.
 2. Code or other applicable Authority requirements, e.g. codes, laws, and other mandates of Authorities having impact of law such as those of ADA.
 3. Applicable Industry Standards, whether specified or not, and which are generally and currently accepted in the Industry as standard for grade of work indicated.
- B. Completeness of the Work: It is the purpose of the Contract Documents to reasonably and professionally convey the quality, extent, and intent of the Work required so that the complete scope of Work can be interpreted there from. The industry does not require that the descriptions be neither highly detailed nor totally complete. It is the intent of the Contract Documents that the Work provided be complete. Provide the necessary work normally provided for the quality of work indicated to ensure that Work is complete.
- C. Deviations from Contract Requirements:
1. General: Inform Architect of deviations from Contract requirements. Work with all entities that will be affected by such a deviation to assure that proper coordination can be accomplished, that new products, if any, which are anticipated to be incorporated can be properly interfaced with the work, are compatible with the interfacing work, and that such work conforms to the intent of the Contract Documents.
 2. Directives from Authorities: Where Authorities direct a change in the work from that originally required by the Contract Documents, do not proceed with such work until securing the Architects consensus that such requirements are in conformance with the intent of the Contract Documents as originally reviewed with the Authorities.
- D. Electronic Files:
1. Basis of Contract: Where electronic files are approved for use on Project, an original hardcopy set in possession of Architect to remain as standard basis of Contract. If Contractor desires, a Third Party may be assigned to hold a Contract representative hardcopy of the Contract Set involved; otherwise Architect's designated set to be representative Contract Set.
 2. Verification: Prior to signing any agreements of Contract, Contractor to verify that work based on electronic files is consistent with original hardcopies.
 3. Conflicts: If any, to be determined by the original hardcopies and not by any information derived from electronic files.
 4. Use of Electronic Data as Basis of Contract: Data may be used, when hardcopies derived from electronic files are signed between Contracting Parties showing their recognition that such derived electronic information can be used in lieu of the designated document(s) in the base representative Contract Set.

1.06 REGULATIONS

- A. General: Comply with all laws, ordinances, rules, and regulations, by any governmental authority, which in any manner apply to or affect those employed in

the Work, the materials used in the Work, and the conduct of the Work. Contractor shall also comply with all such orders and decrees of bodies or tribunals having any jurisdiction or authority over the Work and which are or have the effect of law.

B. Americans with Disabilities Act (ADA):

1. Requirement: All person and entities providing work for this Project is required to be knowledgeable of the requirements of the American Disabilities Act as it affects their portion of the Work. Do not install work not in compliance with ADA.
2. Notification: Prior to any purchase of materials, fabrication, and installation of any work not complying with ADA requirements, notify Architect and secure design direction resolving non-complying features.
3. Design Intent: ADA dimensions indicated and required are either minimums or maximums and are to be adjusted for actual built tolerances so that required dimensions are not violated, e.g. sloping floors, etc. Comply with following.
 - a. Finish to Finish Dimensions: Required dimensions are clearances from finished surfaces.
 - b. "Minimum" Dimensions: The required dimension to be "not less than" that required from the required adjacent finished surface(s) to the ADA component.
 - c. "Maximum" Dimensions. The required dimension to be "not greater than" that required from the required adjacent finished surface(s) to the ADA component.
4. Authority Directives:
 - a. Notification: During the course of the Work, where Authorities may direct changes in the Work, Architect is to be notified prior to the purchase of any materials, prior to the fabrication of any materials, prior to use of any labor, and prior to execution of any work. Do not proceed with the work without the Architect's approval.
 - b. Intent: To avoid conflicts between prior Authority directives and those provided in the field.

1.07 OWNER'S RESTRICTIONS

- A. Owner's Operations: Work is to be scheduled around the Owner's ongoing operations. Prior to the start of the Work, meet with Owner, and clearly define conditions under which the Work is to be performed relative to the Owner's operations including, but not necessarily limited to, the following: regardless of what may be indicated in the Contract requirements prior to signing the Contract for the Work.
1. Times allowed for operations, including high noise generating operations.
 2. Sequence, timing, and extent of areas to be made available to Contractor to complete the required work.
 3. Limits placed on use of each work area.
 4. Methods of moving material and equipment around, within, to and from staging and delivery areas to each work area.

February 27, 2026

5. Degree and duration in which equipment and materials may be left in place at locations in public areas.
 6. Available parking.
 7. Available services, such as for power and water.
 8. Available facilities, such as restrooms.
 9. Available staging areas.
 10. Conditions under which Owner's available facilities and services are provided.
 11. Limitations on generation of noise.
 12. Security required.
 13. Safety precautions and amount of protections required.
 14. Degree of cleanliness and orderliness expected in Work areas.
 15. Special activities of Owner occurring during course of Work and which could impact Work of this Contract.
 16. Verification of any work to be done by Tenants in Owner leased spaces, if any, impacting Work of this Contract.
 17. Verify salvageable work required by Owner.
 18. Other Owner requirements.
- B. Personnel Conduct:
1. Smoking and Controlled Substance Restrictions: Use of tobacco products, alcoholic beverages, and other controlled substances within the on Owner's property is not permitted.
 2. Radios: No radios are allowed on Project site.
 3. CB Devices: May be used, but will be limited to Project use, be used primarily on Project Site or its immediate area, and not be on same wave.
- C. Owner-Contractor Responsibility: In order to avoid any potential conflicts with the Owner and besides the initial pre-work verification of the Owner's intentions, the Contractor and Owner to set up an ongoing procedure to continuously liaison with each other to verify ongoing, anticipated, and potential future Owner operations that may have negative impacts on the Project and to arbitrate in advance of such impacts, methods to ensure that the Project is without any Owner-Contractor conflicts.

1.08 FUNDING REQUIREMENTS AND CONTRACT EXECUTION

- A. The Project is funded in part by State of Hawai'i appropriations that lapse on June 30, 2026.
- B. In order to preserve funding, the Owner intends to:
1. Award and execute the Construction Contract prior to June 30, 2026.
 2. Defer issuance of the Notice to Proceed until all required governmental approvals have been obtained.

February 27, 2026

- C. Contractor acknowledges that Contract execution will occur prior to issuance of Notice to Proceed.
- D. Contract execution shall not authorize commencement of construction activities.

1.09 REGULATORY APPROVALS

- A. The Project requires the following approvals prior to commencement of construction:
 - 1. Environmental Impact Statement (EIS) approval
 - 2. Kauai County Special District Use Permit approval
 - 3. HRS 6E compliance approval from SHPD
 - 4. Building Permit issuance
- B. Construction activities shall not commence until all required approvals have been secured and the Notice to Proceed has been issued.
- C. Owner anticipates that issuance of Notice to Proceed may occur approximately ten (10) months following bid date. This duration is an estimate only and is subject to regulatory processes.

1.10 ARCHAEOLOGICAL MONITORING REQUIREMENTS

- A. This Project is subject to the requirements of HRS Chapter 6E. The Owner is in the process of obtaining a State Historic Preservation Division (SHPD) approved Archaeological Monitoring Plan (AMP). Contractor acknowledges that archaeological monitoring of ground disturbing activities will be required.
- B. The Owner has retained, or will retain, a SHPD-qualified archaeologist to perform monitoring in accordance with the approved AMP. The archaeologist is not under the direction or control of the Contractor.
- C. Archaeological monitoring of ground disturbing activities, , including reasonable coordination and localized suspension of work for inspection and documentation, is an anticipated condition of the Work. Contractor shall include in its Lump Sum Bid all costs associated with scheduling, coordination, access, reasonable standby, and sequencing necessary to accommodate monitoring activities as typically required under HRS Chapter 6E.
- D. Ground disturbing activities include, but are not limited to:
 - 1. Clearing and grubbing
 - 2. Grading
 - 3. Excavation and trenching
 - 4. Foundation construction
 - 5. Utility installation
 - 6. Post holes and landscaping excavation
 - 7. Any subsurface disturbance regardless of depth

February 27, 2026

- E. Contractor shall provide a minimum of five (5) working days advance written notice to the Owner prior to commencement of any ground disturbing activity requiring monitoring and shall coordinate daily operations to allow for monitor availability.
- F. No ground disturbing activity subject to monitoring shall proceed without the archaeological monitor present when required by the approved AMP.
- G. Contractor shall provide safe access to all work areas and shall cooperate fully with monitoring activities. Temporary suspension of localized work to allow inspection, documentation, or evaluation by the archaeologist shall be considered incidental to the Work.
- H. In the event cultural materials or human remains (iwi kūpuna) are encountered:
 - 1. Immediately cease work in the immediate area of discovery.
 - 2. Secure and protect the discovery area.
 - 3. Notify the Owner immediately.
 - 4. Do not resume work in the affected area until written authorization is provided by the Owner following consultation with SHPD.
- I. Except for written suspension of the entire Project issued by the Owner, compliance with this Article shall not be grounds for additional compensation. Requests for time extension shall be evaluated in accordance with the General Conditions.

1.11 NOTICE TO PROCEED

- A. Contract Time shall commence upon issuance of a written Notice to Proceed.
- B. No mobilization, procurement, fabrication, or on-site construction activities shall begin prior to issuance of Notice to Proceed unless expressly authorized in writing by the Owner.
- C. Delay between Contract execution and Notice to Proceed resulting from regulatory approvals shall not constitute grounds for delay damages, unless otherwise provided in the Contract Documents.

1.12 PRECONSTRUCTION PERIOD

- A. During the period between Contract execution and Notice to Proceed:
 - 1. Contractor may be required to submit administrative documents including bonds, insurance certificates, and required certifications.
 - 2. No construction schedule shall be required until Notice to Proceed is issued.
 - 3. No storage of materials on site is permitted.
- B. Contractor shall maintain bid pricing in accordance with requirements stated in Division 00 and the Agreement.

PART 2 - PRODUCTS – (Not Used)

PART 3 - EXECUTION

3.02 CONTRACTOR'S USE OF SITE

- A. General: Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project. Nothing within these Contract Documents shall be interpreted as granting to the Contractor exclusive use and occupancy of the Project Site.
- B. Work Hours: Unless otherwise defined by Contract, work hours to be as follows.
 - 1. Typical Work Week: Monday through Friday, 7:00am to 6:00pm with Owner acceptable noise levels limited to hours between 9:00am to 5:00pm; no noise is allowed before 9:00am or after 5:00pm.
 - 2. Night work: As approved by Owner, Environmental Assessment, Community Ordinances, special permits. If there is a conflict between any of the entities, comply with whichever is more stringent.
 - 3. Weekend Work:
 - a. Saturday: 7:00am to 6:00pm with Owner acceptable noise levels limited to hours between 10:00am to 5:00pm; no noise is allowed before 10:00am or after 5:00pm.
 - b. Sunday: Not permitted.
 - 4. Noise Levels, Definition:
 - a. General: Comply with least noise-producing requirement as established by Owner and Authorities. Contractor to clearly verify and understand all noise level limitations established by Owner and Authorities and include such impact into his proposal; prior to signing Contract for the Work.
 - b. On Owner's Property: Except where Authority requirements are more stringent, Owner to determine what are acceptable noise levels.
 - c. Impact on Community: Secure State of Hawaii "Community Noise Permit." Comply strictly with State of Hawaii requirements.
- C. Site security: The contractor shall be responsible for maintaining a secure site at all times. Any breaches of security, or unusual occurrences shall be immediately reported to the Owner's designated representative.

END OF SECTION

SECTION 01035 – MODIFICATION PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Change Orders.
- B. Related Sections:
 - 1. Division 1 Sections.

1.02 DEFINITIONS

- A. Entity: As used herein, to mean each legal entity under contract for the work indicated in the Change Order, whether directly or indirectly, including but not limited to, the Contractor and each Subcontractor, Supplier, Manufacturer, and Fabricator.
- B. Primary Document: Document that integrates and summarizes primary information from related set or group of more detailed documents. A submittal may consist of a group or hierarchy of primary documents, with master (overall) Primary Document(s) from Contractor, which integrates and organizes all other organized information in a specific submittal document set. These documents may be any of the “submittal types” required herein; where such a document is used to integrate and summarize a more detailed set of documents.
- C. Supporting Documents: Document(s) of significant detail as necessary to fully describe work or portions of work in Change Order; which is generally more detailed for specific information than what is in a related primary document.

1.03 SUBMITTALS

- A. Proposal Request (Change Order Proposal): For each proposal, following.
 - 1. Primary Document: From Contractor, submit proposal description with spreadsheets.
 - 2. Supporting Documents: From each involved Entity, submit specific proposal descriptions with spreadsheets related to each Entity's work.
 - 3. Project Schedule: From Contractor, submit description of impact to Project Schedule, if any.
- B. Payment for Approved Change Orders: For each proposal, following.
 - 1. Primary Document: Submit as part of Contractor's “Application for Payment” on AIA forms G702 and G703; in accordance with Conditions of the Contract.
 - 2. Supporting Documents: From Contractor, each Subcontractor, and each Supplier, submit following.
 - a. Spreadsheets.
 - b. Time Sheets.

c. Invoices.

1.04 QUALITY ASSURANCE

A. General Submittal Format:

1. Submittal Organization: Submit as follows.

- a. Sets: Integrate individual documents into sets.
- b. Identifications: In addition to other required identifications, each related Change Order document and each related document page to be printed with following.
 - i. Change Order Number.
 - ii. Page number.
 - iii. Date.
- c. Change Order Number: Use Architect's approved number.
- d. Descriptions: Standardize information between different document type submittals to ensure that similar information is readily identified; or devise other methods for relating similar information.

2. Document Types: Refer to "Definitions" paragraphs herein.

3. Acceptance: Format and level of detail to be acceptable to Owner. Revise information, if requested, by Owner.

B. Specific Submittal Types: Comply with following when requested for specific submittals.

- 1. General: Information to be detailed and itemized in clear and standard accounting format; acceptable to Owner's Representative and Architect.
- 2. Spreadsheet: In addition to other required data, include direct costs, indirect costs, overhead, profit, and G.I.T. Direct costs to include labor, materials, equipment; relate to specific subcontracts, where applicable. Itemization to include measuring units used for costed item, associated quantities, production rates, man hours, and equipment hours.
- 3. Time Sheets: Submit following from each entity, for all employees and equipment used for work under each approved Change Order.
 - a. Primary Document: Document incorporating employee records and equipment records.
 - b. Supporting Documents:
 - i. Employee Payroll Records: Include employee names, dates when work performed, and related tasks performed on specific dates; with accounting cost codes, and associated cost accounting.
 - ii. Equipment Records: Include equipment used, operator, dates of use, tasks performed on specific dates; with accounting cost codes, and associated cost accounting.
- 4. Invoices: From each entity, material invoices to be on letterhead, with invoice numbers, dates, itemized materials list descriptions, accounting cost codes and associated cost accounting. Invoiced work to show work specific to each

February 27, 2026

Change Order.

- C. Lien Waivers: Submit releases of each Entity, indicating that each work has been paid for. Releases for Change Order work should be specific to Change Order; not general to or include other work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 PROCEDURES

A. Proposal Request:

1. Initiation: May be initiated by Contractor or may be initiated by a request for proposal from the Architect to the Contractor and resulting in Contractor's "Proposal Request" to Architect and Owner's Representative.
2. Architect's Request for Proposal: Request is neither a Change Order nor directive to proceed with the work, but is a request for information on how proposed change may alter the Contract Sum and Project Schedule. Contractor is to provide information in accordance with the request.
3. Time of Submission: Prior to commencing proposed work, but not later than required to allow for proper review by Owner, Owner's Representative, and Architect, and as necessary to allow for timely incorporation into Project Schedule.

B. Change Order: For Owner acceptable Proposal Requests following is to be accomplished.

1. Architect's Responsibility: Issue AIA Document G701, Change Order.
2. Contractor's Responsibility: With Owner, Owner's Representative, and Architect, sign Change Order. Upon receiving Change Order, comply with following.
 - a. Progress Schedule: Incorporate into Progress Schedule and submit revised schedule; unless otherwise acceptable to Owner's Representative and Architect.
 - b. The Work: Proceed with the work.
 - c. Application for Payment: Upon completion of work, submit request for payment as part of first application for payment due after work complete. Application for Payment to distinguish each Change Order work from other work.

END OF SECTION

SECTION 01040 - COORDINATION

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Administrative requirements.
 - 2. Coordination of Owner's work.
 - 3. Coordinate with other Contractors and adjacent projects.
- B. Related Sections:
 - 1. Division 01 Sections, general.
 - 2. Section 01010 - SUMMARY OF WORK.
 - 3. Section 01330 – SUBMITTAL PROCEDURES.
- C. Requirements Superseded
 - 1. The following will be applicable unless superseded by the Owner or Request for Proposal.
 - 2. Requirements shall be as directed by the Owner.

1.02 SUBMITTALS

- A. Superintendent & Quality Control Officer Resume:
 - 1. Document: Submit copies of each person's written resume.
 - 2. Submittal Time: Prior to execution of the Contract.
- B. Contractor's Organization Chart and Key Personnel & Assignments:
 - 1. Document: Submit written organization chart and list of officers and key personnel. Chart to indicate general hierarchy of those responsible to Project from CEO down to those on Project Team. List to include names, titles, description of primary responsibilities, addresses, and direct phone and/or cell phone, facsimile, and E-mail addresses.
 - 2. Submittal Time: Within 10 working days after Notice to Proceed is given by Owner.
- C. Primary Subcontractors:
 - 1. Document: Submit written list of primary Subcontractors for each key part of the Work. List to include name of company, address, phone and/or cell numbers and facsimile numbers, and primary personnel to be contacted.
 - 2. Submittal Time: Within 10 working days after Notice to Proceed is given by Owner.
- D. Project Progress Reports and Progress Schedule: Refer to specific requirements in other paragraphs herein.

February 27, 2026

E. Progress Meetings:

1. Document: Submit written document of agenda for each scheduled meeting. List all parties copied.
2. Submittal Time: Submit written agenda, to be received, not less than 2 working days prior to each scheduled meeting and distribute to all invited parties. Provide additional copies at each meeting.

1.03 QUALITY ASSURANCE

A. Key Personnel Qualifications:

1. General: Experience and skills to be commensurate with responsibilities.
2. Lead Personnel:
 - a. Experience: Not less than 10 years current experience in supervising work of scope and complexity of this Project.
 - b. Commitment: For duration of Project. Where replacement is necessary, it is mandatory that lead personnel provide a transition period necessary to fully inform replacement of all his responsibilities, but not less than 20 working days. If any lead personnel is replaced, replacement to be acceptable to Owner's Representatives.
 - c. Superintendent: Assign a full time Superintendent responsible for the Project in its entirety.
 - d. Scheduling Engineer: Minimum of 5 years in relevant construction.
 - e. Quality Control Officer: Assign a full time Quality Control Officer with singular responsibility in assuring that quality of job and materials are in accordance with intent of Contract.
3. Immediate Assistants to Lead Personnel:
 - a. Second-In-Line Experience: Those second-in-line to lead personnel should have similar experience and be fully capable of assuming lead personnel's responsibilities where lead personnel should they have to leave position for whatever reason; whether temporary or permanent.
 - b. Experience of Other Related Personnel to Lead Positions: Assign other personnel to assist primary lead personnel as required. Ensure that each personnel has specific expertise in areas for which they are responsible.
4. Other Key Personnel:
 - a. Detailers: Assign a minimum of two (2) detailers to be on site at all times for the duration of the Project. Detailers shall have no less than 10 years current experience in construction detailing of the same scope and complexity of construction of this Project.

B. Project Progress Reports:

1. General: Refer to "Execution" paragraphs herein for specific submittal requirements.
2. Format: Format and data required to be acceptable to Owner and his Representatives.

February 27, 2026

3. Condition for Payment: It is a condition that data for reports be submitted and that they are up to date and in conformance with Owner's Representative's requirements for certification of any Payment Requests. Any incomplete report will not be reviewed until compliance is achieved.
4. Contractor's Records: Produce reports on a regular and continuous basis for full duration of Project to give a continuous ongoing representation of Project progress. Maintain such reports regardless of whether such reports are required to be submitted on a regular basis. Provide such reports for review by Owner's Representatives whenever requested.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 ADMINISTRATIVE REQUIREMENTS

A. Progress Meetings:

1. Contractor's Meetings: As required for proper coordination of the Work.
2. OAC (Owner, Architect, Contractor) Meetings:
 - a. Time: Establish a regular scheduled meeting to occur twice each month for which attendance is required for the invited participants. Work with Architect in establishing dates and times agreeable to primary parties involved.
 - b. Agenda: Prior to each meeting, verify agenda from Owner, Architects, and other invited parties. Incorporate with Contractor's agenda where different.
 - c. Participants: Each meeting will include the Contractor, the Owner, the Architect, other Subcontractors, and such other parties deemed necessary by the Contractor, and the Architect, or Owner, based upon agenda required by meeting. At each meeting, for each Entity there is to be representation by at least one participant who can make binding decisions for the party or company he/she represents. Requests for participation of any of the Architect's consultants shall be through the Architect.
 - d. Minutes – Contractor's Responsibility.
 - i. Recording: Record detailed minutes.
 - ii. Distribution: Distribute written minutes of each meeting within 3 working days of each meeting. Distribute to Owner's Representatives and their Consultants and to all parties affected by decisions of each meeting and for which Contractor has responsibility for.

B. Preinstallation Conferences:

1. General: Conduct as required by Sections within this Project Manual.
2. Contract (Specified) Conferences: Comply with specified requirements and requirements under "Progress Meetings" paragraphs herein.

February 27, 2026

C. Construction Activities:

1. General: Coordinate to assure efficient and orderly installation of each part of the Work.
2. Progress Schedule: Continually update schedule to reflect current progress of the Work.
3. Project Progress Reports: Keep written daily records of progress of Project.
4. Administrative Submittals: Refer to Division 1 - Submittals Section for requirements.

D. Coordination of Owner Furnished, Contractor Installed Work:

1. Take-Offs: Submit take-offs to Owner to determine quantities required. Verify and include extra stock, if required by Owner. Determined quantities are to be considered as adequate to accomplish each work. Related materials and any additional materials, if required, are to be provided by Contractor at his expense.
2. Contractor Responsibility:
 - a. Delivery: Coordination with Owner to ensure materials are delivered in timely manner to Project site is Contractor's responsibility. Include data in Progress Schedules.
 - b. Pickup and Redelivery of Materials: Pickup materials from Owner's onsite storage or delivery areas as directed by Owner. Deliver materials to Contractor's selected off site, bonded fully enclosed and security monitored warehouse facilities for temporary storage, if required. Redeliver materials when required to Project Site for installation.
 - c. Insurance: Maintain insurance covering full replacement of all materials for theft and damage.
 - d. Extra Stock: At time of pickup of materials, leave required extra stock materials in Owner's storage areas. Deliver poly-wrapped remaining overages, if any, from installed work after Architect selects usable pieces.
3. Coordination of Owner Furnished, Owner Installed Work: Contractor responsible for coordination of work to ensure that work performed by Owner in timely manner for proper completion of Project, unless other schedule acceptable to Owner.

3.02 PROJECT PROGRESS REPORTS - SUMMARY OF TYPES

- A. Project Progress Manual: Manual consisting of compilation of various reports, including following.
1. Project progress summary sheet.
 2. Project Schedule Summary, abbreviated overview.
 3. Cash flow reports.
 4. Project drawings.
 5. Project progress photos - selected.

February 27, 2026

6. Payment Request.
7. Lien Waivers.
- B. Other Project Progress Reports: Other reports include following.
 1. Submittal Status Reports.
 2. RFI Status Reports.
 3. Change Order Status Reports.
 4. Material Status Reports.
 5. Stored Materials Status Reports.
 6. Daily Manpower Status Reports.

3.03 PROJECT PROGRESS REPORTS - PROJECT PROGRESS MANUAL

- A. General:
 1. Format: Submit a finished and bound manual in a format acceptable to Architect and complying with requirements herein.
 2. Submittal Time:
 - a. For Approval of Format: Submit draft of proposed manual within ten (10) working days after Notice to Proceed is given. Adjust format and data categories as required until successful review of documents by Owner and Architect is achieved.
 - b. Thereafter during Contract Period: Submit updated manuals for each application for payment in advance of the day that the executed application for payment is due to the Owner and as required for timely and reasonable full review by Owner's Representatives. The certified (executed and signed) "Application for Payment" is due to the Owner on the 20th calendar day of each month, or the working day closest to the 20th where the 20th falls on a weekend.
 - c. Closeout Submittal: Submit all successfully reviewed records to Owner as historical record of Project. Comply with Division 1 - Project Record Documents Section.
- B. General Binding Requirements:
 1. Covers: Hardcover front and back.
 2. Binding: To allow for removal of contents.
 3. Cover Sheet: First page to be a cover sheet showing official Architect's title for Project, Owner's designated Project Number, and such other data to be determined.
 4. List of Primary Involved Entities: Provide name, address, telephone numbers, and primary contacts of Contractor, Owner, Architect and Architect's Consultants.
 5. Contents: Three hole punched copies of required data. Format data at bound edge with enough space to allow readability of all data and so that punched holes do not obscure any data.

February 27, 2026

6. Size: 8-1/2" x 11"; or as otherwise acceptable to Owner's Representative. 8-1/2" x 17" or other standard size foldouts will be considered.
 7. Dividers: Provide tabbed and labeled indexed dividers for each primary section of information.
- C. Project Progress Summary Sheet: Written narrative summarizing primary current Project activities by area and Trade. In addition to indicating general status of activities, list any scheduling or construction problems and current strategies for resolving such problems, if any.
- D. Progress Schedule - Summary Sheet: Refer to "Progress Schedule" paragraphs herein.
- E. Cash Flow Reports:
1. Document: Graphs generated from Progress Schedule software showing cash flow over time. Document to show two graphs consisting of base line graph and current actual cash flow.
 2. Base Line Graph: Contractor's proposed cash flow for Project projected over Contract duration.
 3. Actual Cash Flow Graph: Contractor's actual expenditures to date of submittal.
- F. Project Drawings: To be selected by Owner and may include Site Plan, primary elevations, and typical units.
- G. Payment Request Documents: Submit all of following at time of each application for payment.
1. Document - Application & Certificate for Payment: Execute on AIA Document G702; current document.
 2. Document - Schedule of Values:
 - a. Data: All costs to be current up to 20th day of each month or such other date approved by Owner's Representatives.
 - b. Form: Submit spreadsheet generated by computer software, e.g. Excel or other Architect acceptable software. Data to coincide with data provided on cash flow reports.
 - c. Format - Form: Submit organized and detailed cost breakdown similar to categories and organization of AIA Document G703; current document.
 - d. Format - Basic Data Organization: Organize each related work into same primary work related categories as specified in Specifications. Identify each work group by similar Specification Section number and title; then show detailed breakdown of each work thereunder.
 - e. Other Related Costs: Include other related costs as separate line items as required to show complete cost for the Work including, but not limited to, following.
 - i. Performance and Payment Bonds.
 - ii. Field Supervision and layout.
 - iii. Temporary Facilities and Controls.

February 27, 2026

iv. Insurance.

v. Gross Income Tax.

vi. Overhead & Fee.

f. Total: Indicate total sum of all line items to equal the Contract Amount.

g. Figures: Round off to nearest dollar.

H. Lien Waivers:

1. General: Submit waivers of lien from every entity who could lawfully and possibly file a lien in excess of \$100 arising out of the Contract. Waivers to clearly show entity providing work and signature in script and printing of person who can legally bind company and with person's title. The Owner reserves the right to designate which entities involved in the Work must submit waivers.

2. Document - Types:

a. Partial Lien Waivers: Except for Final Payment Request when Final Lien Waivers required, submit Partial Lien Waivers for all work up to last certified Payment Request. Submit waivers on forms provided in Appendix or on other forms acceptable to Owner.

b. Final Lien Waivers: Submit final lien waivers in conformance with General Conditions of the Contract and Division I – Contract Closeout requirement; covering substantially all work required under Contract.

3. Lien Waivers From: Waivers required from each of following.

a. Contractor.

b. Subcontractors.

c. Suppliers.

d. Tax Lien Releases.

e. Union Lien Releases.

f. Other as required to comply with requirement and as otherwise requested by Owner.

4. Project Progress Photographs: Owner's Project Representative's selected color (xerox) reproductions of photographs as required by Section 01720 - Project Record Documents Section to be included.

3.04 PROJECT PROGRESS REPORTS - OTHER REPORTS

A. General Submittal Requirement: Except for "Daily Manpower Status Report", submit all of "Other Reports" into a single bound volume.

B. Submittal Status Reports:

1. Document: Submit a written document in table form indicating proposed baseline schedule for submission of submittals to be received, forwarded, and returned from all involved Parties and show schedule of actual status of submittals. Indicate involved Parties of each submittal and dates related to each status category.

February 27, 2026

2. Submittal Time: Submit with each Payment Request and updated document with data current to submittal date.
- C. RFI Status Reports:
1. Document: Submit a written document in table form indicating current status of RFI's. Indicate involved Parties of each RFI and dates related to each status category.
 2. Submittal Time: Submit with each Payment Request and updated document with data current to submittal date.
- D. Change Order (CO) Status Reports:
1. Document: Submit a written document in table form indicating current accounting status of CO's.
 2. Data: In addition to any other data, following should be incorporated for each line item related to a specific CO.
 - a. Change Order number.
 - b. Related Specification Section number.
 - c. Proposed pending Change Order cost.
 - d. Date submitted.
 - e. Date approved.
 - f. Approved Change Order amount.
 - g. Amount paid to date and date paid.
 - h. Unpaid balance.
 - i. Subtotals for each category.
 - j. Total adjusted Contract Sum with included "Approved Change Orders".
 - k. Total adjusted Contract Sum for "potential total Contract Sum" based upon base Contract Sum and "approved" and "pending" Change Orders.
 3. Submittal Time: Submit with each Payment Request and updated document with data current to submittal date.
- E. Material Status Reports:
1. Document: Submit a written document in table form indicating proposed baseline schedule for ordering and delivery of materials and actual status of orders and delivery dates.
 2. Submittal Time: Submit with each Payment Request and updated document with data current to submittal date.
- F. Stored Materials Status Reports:
1. Document: Submit spreadsheet generated by computer software, e.g. Excel or other Architect acceptable software.
 2. Submittal Time: Submit with each Payment Request and updated document with data current to submittal date.

February 27, 2026

3. Format: Provide detailed itemized list. Each line item to be described by related specification number, short description and cost, freight costs, and applicable taxes. Accounting to be coordinated with accounting on "Schedule of Values".
 4. Substantiating Data: Submit following.
 - a. Invoices.
 - b. Quantities of stored material.
 - c. Location of Oahu based warehouse(s). Indicate storage facility, address, and phone number.
 - d. Proof of insurance coverage for full replacement value of stored materials.
 - e. Proof that storage facility is bonded.
- G. Daily Manpower Status Reports:
1. Document: Submit spreadsheet generated by Progress Schedule software of daily manpower requirements for each Trade.
 2. Submittal Time: Submit with updated documents at end of each work week.

3.05 PROJECT PROGRESS SCHEDULES

- A. Documents: Types of Schedules include following.
1. Project Progress Schedule Summary:
 2. Project Progress Schedule.
 3. Submittal Times: Submit draft of proposed manual within ten (10) working days after Notice to Proceed is given. Adjust format and data categories as required until successful review of documents by Owner and Architect is achieved.
 4. Thereafter during Contract Period: Submit updated copies for each I application for payment. Project Schedule Summary to comply with requirements for Project Progress Manual.
- B. Progress Schedule - General:
1. Computer Program: Schedule to be generated by computer program, e.g. Primavera Project Planner, or other similar program capable of similar detailed CPM network and other Project schedule analysis and reporting. Other comparable software products to be acceptable to Construction Manager.
 2. Basis of Project Progress: First Architect approved submittal to be used as baseline Schedule to track Contractor's progress as shown by required updated Schedule submittals thereafter.
 3. Additional Float Time:
 - a. Period: Schedule in an additional float time of 30 calendar days.
 - b. Ownership: Owner to retain ownership of this float time and its use will be at the Owner's discretion.

February 27, 2026

- c. Internal float owned by the project. Float consumption is based on first come first serve basis.
- C. Project Progress Schedule Summary:
 - 1. Schedule Type: Horizontal bar type showing Contractor's original base Schedule and actual current Schedule superimposed onto same document.
 - 2. Submittal Time: Incorporate updated copies into Project Progress Manual and submit in accordance with requirements for Project Progress Manual.
- D. Project Progress Schedule:
 - 1. Schedule Type: Detailed CPM (Critical Path Method) Schedule.
 - 2. Submittal Time: Submit three (3) updated sets at time of each Payment Request in electronic and hard copy format.
 - 3. Three (3) week look ahead schedule to be submitted weekly showing work in progress for the current week and the forecast of 2 weeks ahead. This schedule should be based on actual field condition and in line with current approved schedule.

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section Includes:
 - 1. Cutting and patching work.
- B. Related Sections:
 - 1. Division 1 Sections, general.
 - 2. Division 1 - Quality Control.

1.02 DEFINITION:

- A. “Cutting and Patching”: The phrase as used herein is defined as follows.
 - 1. Cutting and patching includes cutting into existing construction to provide for the installation or performance of other work and subsequent fitting and patching required to restore surface to their original condition.
 - 2. Cutting and patching is performed for coordination of the work, to uncover work for access or inspection, to obtain samples for testing, to permit alterations to be performed or for other similar purposes.
 - 3. Cutting and patching performed during the manufacture of products, or during the initial fabrication, erection or installation processes is not considered to be “cutting and patching” under this definition. Drilling of holes to install fasteners and similar operations are also not considered to be “cutting and patching”.
 - 4. “Demolition” is recognized as related-but-separate category of work, which may or may not require cutting and patching as defined in this Section.

1.03 SUBMITTALS:

- A. Methods: Notify Architect when any work is limited by requirements stated under “Quality Assurance” paragraphs. If requested, submit methods of cutting and patching for this Work. Do not begin Work, until successful review accomplished.

1.04 QUALITY ASSURANCE:

- A. Structural Work: Do not cut and patch any work in a manner that would result in a reduction of its load-carrying capacity or of its load-deflection ratio.
- B. Operational and Safety Limitations: Do not cut and patch operational elements or safety related components in a manner that would result in a reduction of their capacity to perform in the manner intended, including energy performance, or that would result in increased maintenance, or decreased operational life, or decreased safety.
- C. Matching of Exposed-to-View Surfaces: Patching work should not be evident in final exposed-to-view work. Do not cut and patch work which is exposed-to-view in the finished Work and which cannot be restored to satisfactorily match the

February 27, 2026

surface in which the cutting and patching is done. Quality of match and final appearance of patched work to be determined by Architect.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. General: Except as otherwise indicated or as directed by the Architect, use materials for patching that are identical to existing materials. If identical materials are not available, or cannot be used, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect. Use materials for patching that will result in equal-or-better performance characteristics.

PART 3 - EXECUTION

3.01 INSPECTION:

- A. Examination: Before cutting, examine the surfaces to be cut and patched and the conditions under which the work is to be performed. If unsafe or otherwise unsatisfactory conditions are encountered, take corrective action before proceeding with the work.

3.02 PREPARATION:

- A. Temporary Supports: When required, to prevent failure or unsafe conditions, provide temporary supports for work to be cut.
- B. Protection: Protect other work during cutting and patching to prevent contamination and damage. Provide protection from adverse weather conditions for that part of the Project that may be exposed during cutting and patching operations.

3.03 PERFORMANCE:

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition
- B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.

February 27, 2026

3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 4. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portions of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 5. Proceed with patching after construction operations requiring cutting are complete.
- C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.
 3. Floors, Walls and Ceilings: Where walls or partitions that are removed extend one finished area into another, patch and repair floor, ceiling and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor, ceiling and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- 3.04 CLEANING:
- A. General: Thoroughly clean areas and spaces where work is performed or used as access to work. Remove contaminants from all surfaces without damaging finish of contaminated surfaces.

END OF SECTION

SECTION 01046 – REQUEST FOR INFORMATION

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Administrative requirements for “RFI’s”.
- B. Related Sections:
 - 1. Division 1 Sections.

1.02 DEFINITIONS

- A. Request for Information (RFI): Contractor’s written request for information to confirm, verify, or further clarify intent required by Contract Documents.

1.03 SUBMITTALS

- A. Architect’s Form: Submit RFI on Architect’s form. Secure form from Architect where not included with Contract Documents.

1.04 QUALITY ASSURANCE

- A. Architect’s Intent: It is a condition to the Contract for the Work, that prior to the signing of the Contract, that the Contractor be fully familiar with and clear to the requirements (Architect’s design intent) for this Project as represented in the Contract Documents. It also a condition to the Contract for the Work, that prior to the signing of the Contract, should there be any aspect of the Contract which is not clear or not complete enough, that the Contractor is to secure the necessary information from the Architect in order to attain the required understanding of the Project. The primary reasons for this are as follows.
 - 1. Contract Amount: It is important that the Owner secure a fair and complete cost proposal for the Work; without hidden or additional costs to the Owner.
 - 2. Administrative Costs: Minimize unnecessary costs to administer the Project during the progress of the Work.
- B. Architect’s Drawings & Specifications:
 - 1. Design Intent: It is an accepted historical and understood practice in the industry that the Architect’s Drawings and Specifications reasonably and professionally convey his design intent for the Project, without necessarily indicating every single condition for the Work, but to the degree necessary that Contractors can propose a fair and complete cost for the Work, including for the work not indicated, but implied by the Architect’s design intent.
 - 2. RFI’s - Basis of Communication: Due to the fact all conditions are not indicated by the Contract Documents it is understood that additional clarifications will be made necessary during the course of the work by the Contractor in order to fully achieve all aspects of the Architect’s design intent and that the RH procedure becomes the administrative basis by which information is formally communicated between the Architect and the Contractor.

February 27, 2026

C. Misuse of the RFI Process:

1. RFI's are not to be used in an adverse and frivolous manner, e.g., as a method of enlisting the Architect's services for finding information already indicated in the Contract Documents, as a means for forwarding non-legitimate claims for increases in Contract Amount or Contract Schedule that is already intended by Contract, etc.

D. Contractor Initiation: RFI's must be submitted through the General Contractor.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 PROCEDURE

A. Contractor's Responsibilities

1. Examination: Upon discovering a potential aspect of the Work which may require further clarification from the Architect, thoroughly examine the Contract Documents to ensure that the information is not indicated.
2. Submittal, failure to provide any of the below shall be considered an incomplete RFI submission.:
 - a. Use of Architect provided RFI form.
 - b. General: Where a reasonable search for needed information has been conducted without success, complete and submit an RFI.
 - c. Contractor's Interpretation: In space provided or as an attachment, if required, submit Contractor's interpretation of what he believes to be Architect's intent for area or subject requiring clarification. Also provide a narrative of the contractors contracted scope to provide a complete and occupiable project. All RFI's shall also provide a contractor provided solution as a "no cost solution".
 - d. Cost and Schedule Impact: Each RFI must indicate whether there will be a cost and/or schedule impact linked to it. Nebulous or inconclusive statements such as potential or pending are not acceptable, a rough order of magnitude shall be included in RFI.

B. Architect's Responsibilities:

1. Review: Not less than 5 and no later than 10 working days after each RFI is received. Working days shall be counted as whole days on RFI logs. Return to Contractor a response on the submitted form.

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Use of Standards.
 - 2. Abbreviation/Acronym use and format.
 - 3. Definitions.
- B. Related Sections:
 - 1. Division 1 Sections.
 - 2. Divisions 2 – 16

1.02 STANDARDS

- A. Requirement: Each type of work provided for this Project is required to comply with recognized Industry standards (also may be referred to as “references”) that are applicable to the class of work intended by the Contract Documents. Compliance is required whether such standards are indicated or not and whether such standards are in published form or an unwritten but accepted practice in the Industry for the class of work.
- B. Use:
 - 1. General: Where a specific standard is indicated, this is to be interpreted as a method for conveying the design intent and its use expands on or clarifies the requirements and its use is not intended to limit or to negate the specific Industry standards intended to apply to the class of work to be provided.
 - 2. Conflict: Where several Industry standards apply to the Work, and where quality requirements of these applicable standards conflict for the class of work required, it is intended that the standard producing the higher quality work is to apply.

1.03 ABBREVIATIONS/ACRONYMS:

- A. General: Abbreviations and acronyms are used throughout the Contract Documents. If any abbreviation or acronym is not understood, these should be verified from the Architect.
- B. Industry Acronyms: Generally, but not necessarily, these are abbreviations or acronyms of Industry organizations, e.g. ASTM, AWI, WIC, NRCA, SMACNA, etc.
- C. Architect Created Acronyms: Where used in Contract Documents the following format is used.
 - 1. Format: Abbreviation of one or several letters, followed by a hyphen, followed by an identification number, e.g. WD-1 for wood type number one or WPM-1 for waterproof membrane type one.

2. Number Sequence and Related Sections: Designations may be used between related specification sections where primary product is similar and therefore numbers are not necessarily sequential within a specific specification section, although the numbering will be sequential between all related sections where similar designations are used.

1.04 DEFINITIONS

- A. Related Sections: The listed specification sections under the “Related Sections” paragraphs indicate some of the primary related work which is impacted by the work of the specific specification section in which the list appears. It is not intended as a complete list (which in many cases would otherwise be enormous) but has been provided to assist the Contractor.
- B. Exposure Definitions: Unless otherwise indicated, the following definitions are to apply.
 1. Exterior Surfaces: Exposed on the outside envelope of structure or surfaces of other constructed elements and equipment which are exposed to the “outside air”. Covered or protected areas “open to the (outside) air” and not fully enclosed by walls, floors, roofs, windows, and doors, are to be considered as part of the exterior and surfaces occurring in such spaces are to be considered exterior surfaces.
 2. Interior Surfaces: Surfaces interior to the fully enclosed envelope of a structure or within the fully enclosed envelope of other constructed elements and equipment. These surfaces are not exposed to the “outside air”.
 3. Exposed: Surfaces which are exposed to view from any vantage point, which are not concealed from view due to permanent non-accessible construction or earth, and which is not defined as semi-exposed.
 4. Semi-Exposed: Surfaces not readily visible but are accessible and viewable from selected vantage points. These surfaces include those hidden by and hidden on removable or openable doors, panels, and drawers, and surfaces of undersides of shelves, counters, desks, and toe spaces, surfaces which are hidden by moveable equipment/furnishings, and other similar surfaces.
 5. Concealed: Surfaces not exposed to view from any vantage point and which is concealed by permanent non-accessible construction, earth, and equipment/furnishings. Such concealed surfaces include those surfaces permanently concealed within inaccessible wall cavities, above inaccessible ceilings, within inaccessible floor construction, within inaccessible shafts, and those buried underground in earth. Include within this definition, surfaces above otherwise semi-exposed accessible suspended acoustical ceilings and the interior portions (except ferrous metal components) of the elevator shaft which are to be considered as concealed spaces.
- C. Type: Word is defined to mean any characteristic(s) which makes a product different or unique from another product; including differences which could occur when it is the same product, e.g. products of nature such as those made from wood or stone. Characteristics include, but are not limited to, those of size,

February 27, 2026

shape, profile, finish, texture, color, pattern, chemical/material composition,
material performances, etc.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01210 - ALLOWANCES

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes administrative and procedural requirements governing allowances.
 - 1. Certain materials, equipment, and services are specified in the Contract Documents by allowances. In some cases, these allowances include installation. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when additional information is available for evaluation. If necessary, additional requirements will be issued by Change Order.
- B. Types of allowances include the following
 - 1. Lump-sum allowances
- C. Related Sections Include the Following
 - 1. Section 01250 – CONTRACT MODIFICATION PROCEEDURES for procedures for submitting and handling Change Orders.

1.02 DEFINITIONS

- A. Allowances; Cash amounts established in the Contract Documents to be included in the Contract Base Sum to cover the cost of items not specified in detail.

1.03 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.
- B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- C. Purchase products and systems selected by Architect from the designated supplier.

1.04 SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.
- B. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- C. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.
- D. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

February 27, 2026

1.05 COORDINATION

- A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.06 LUMP SUM ALLOWANCES

- A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight, and delivery to Project site.
- B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner or selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.
- C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
 - 1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.
- D. At Project closeout, credit unused amounts remaining in the lump sum allowance to the Owner by Change Order.
- E. Allowances shall be used only upon written authorization from the Owner.
- F. Overruns beyond listed Allowances shall be adjusted using established unit prices.

PART 2 - PRODUCTS - (Not used)

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.02 PREPARATION

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.03 SCHEDULE OF ALLOWANCES

- A. Allowance A: Lump Sum Allowance: Include sum of \$39,000 for Removal and Disposal of Hazardous Materials concealed, encapsulated, or otherwise unidentified that may be encountered during construction.
 - 1. Unit Prices identified in the Section 01270 VARIABLE QUANTITIES UNIT PRICES and on the Bid Form shall be used to determine value of Work performed under this Allowance.

February 27, 2026

END OF SECTION

SECTION 01270 - VARIABLE QUANTITIES UNIT PRICES

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes administrative and procedural requirements for unit prices.

1.02 DEFINITIONS

- A. Unit price is an amount proposed by the Bidder (or Offeror), stated on the Bid Form, as a price per unit of measurement for materials or services included in the Total Lump Sum Bid Price.

1.03 RELATED DOCUMENTS

- A. Variations in estimated quantities are governed by GENERAL CONDITIONS Section VARIATIONS IN ESTIMATED QUANTITIES.

- B. Measurement and payment for unit price items are governed by the General Conditions.

1.04 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, coordination overhead, and profit.
- B. List of Unit Prices: A list of unit prices is included at the end of this Section. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.
 - 1. The description of Variable Quantities Unit Price items is not intended to give a detailed description of all work required, as only principal features of such work are listed.
 - 2. Detailed descriptions are given in the appropriate Specification Sections or Drawings named in the general description below.
- C. Include Variable Quantities Unit Price costs on the Bid form.
- D. All computations of the Variable Quantities Unit Prices shall use the unit prices noted in the Bid Form. Measurements will be to the nearest estimated unit quantity. Payment will be made for quantities actually installed at the applicable price, measured by the Offeror, concurred by the Contracting Officer, and acceptably completed.
- E. The Variable Quantities Unit Prices are estimated quantities. Where the quantity of a pay item vary more than 15 percent above or below the estimated quantity stated in the contract, an adjustment in the contract price may be made upon demand by either the State or Contractor. The adjustment shall be based upon any increase or decrease in costs due solely to the variation above 115 percent or below 85 percent of the estimated quantity.

February 27, 2026

- F. Do not proceed with work exceeding the estimated quantities written in the Bid Form until receipt of written approval by the Contracting Officer.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 LIST OF VARIABLE QUANTITIES

A. Unit Price No. 1

Description: Testing of Suspect Hazardous Materials according to requirements by authorities having jurisdiction based on type of potential hazardous materials encountered.

1. Asbestos Containing Materials.
2. Lead based Paint.

B. Unit Price No. 2

Description: Removal and Disposal of Asbestos Containing Materials according to requirements by authorities having jurisdiction based on type of hazardous materials encountered and test results.

1. Removal of Asbestos Containing Materials that exceed threshold limits as defined by Environmental Protection Agency (EPA), National Emission Standards for Hazardous Air Pollutants (NESHAPS), State of Hawaii Department of Health (DOH), and Occupational Safety and Health Administration (OSHA).

C. Unit Price No. 3

Description: Removal and Disposal of Lead Based Paint Coated Materials that cannot be encapsulated according to requirements by authorities having jurisdiction based on type of hazardous materials encountered and test results.

1. Removal of Asbestos Containing Materials that exceed threshold limits as defined by Environmental Protection Agency (EPA), National Emission Standards for Hazardous Air Pollutants (NESHAPS), State of Hawaii Department of Health (DOH), and Occupational Safety and Health Administration (OSHA).

END OF SECTION

SECTION 01330 – SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Administrative and procedural requirements for submittals.
2. Administrative submittals.
3. Work related submittals.

B. Related Sections:

1. Division 1 Sections, General.
2. Section 01320 – CONSTRUCTION PROGRESS DOCUMENTATION for submittal schedule requirements
3. As required in Conditions of Contract and Specification Sections.

1.02 DEFINITIONS

A. Work Related Submittals: Are defined as submittals which are product specific, which are required for the evaluation, fabrication, and incorporation of the product into the Work, and which are commonly known as “product data”, “shop drawings”, “samples”, and “mockups”.

B. Miscellaneous Submittals: Are defined as submittals which ensure the quality of the Work after the termination of the Contract and are also submittals of additional products required by the Contract but not required for installation. These submittals include, but are not necessarily limited to, the following.

1. Contractor’s Project warranty.
2. Contractor’s specific warranties.
3. Installers’ warranties.
4. Manufacturer’s standard and required warranties.
5. Operating and Maintenance Manuals.
6. Owner’s extra stock.
7. Maintenance tools and spare parts.

C. Submission Time: The indicated time for any submissions is not to mean “the last day when such submissions are to be mailed out”, but shall mean “the last day such submissions are to be received” by the addressee and that such submissions are due no later than 12 noon of the due date, unless otherwise acceptable to the Architect.

1.03 SUBMITTALS, GENERAL

A. Requirements: Refer to the Conditions of the Contract and all respective specification sections for complete submittal requirements. Electronic Submittals

preferred, except finish materials-samples shall be hardcopy. Where finish is as specified request electronic submittal first as most will not require hardcopy.

B. Number of Submittals Required:

1. Electronic: Adobe PDF file, unlocked and compressed to be less than 10 MB total file size. Architect to establish File Transfer Protocol (FTP) site and instructions for uploading and response.
2. To the greatest extent possibly make submittal in electronics format indicated above. If submittals cannot be made electronically comply with the following:
 - a. Hardcopy: Submit four (4) sets where not otherwise indicated and additional sets as the Contractor requires for his Work.

C. Requirements for Each Submittal Set: Each set consists of the following.

1. Letter of Transmittal: Include following minimum information.
 - a. Contractor's Submittal Number.
 - b. Architect's Project name and Project number.
 - c. Contractor's name, address, phone number, and Project number.
 - d. Date of Issue.
 - e. Names of Transmitter and to whom submittal transmitted to.
 - f. Names of Subcontractor, Manufacturer, and Supplier.
 - g. Purpose of transmittal.
 - h. Distribution record.
 - i. Specification Section related to.
 - j. Complete list of enclosures, including number of pages for each listed enclosure, descriptions, number of each enclosure transmitted, and dates of enclosures.
 - k. Contractor's unequivocal certification stating that the information complies with the requirements of the Specific Project Contract Documents. No variation of language is acceptable.
 - l. Signature of Transmitter in script and print.
2. Enclosures: Complete submittal enclosures with each enclosure identified as follows.
 - a. Identify each sheet/page with Architect's Project number, submittal date as indicated on transmittal, and submittal number.
 - b. Staple submittals together wherever possible, except where review would be hindered by bound copies. Do not submit loose sets. Temporarily bind each set for transmittal.
3. Letter of Transmittal/ Contractors Stamp: shall not include
 - a. Statements in any form relieving, diminishing and/or transferring Contractors requirements to the project scope and contract requirements.
 - b. Requirements for Architect and/or its consultant to provide more than a summary confirmation review for basic scope requirements.

- c. Submittal items that are not per project scope shall be submitted prior per the substitution request process.
- 4. Preference for Electronic Submittals/Shop Drawings:
 - a. Architect prefers where possible electronic submittals. Process shall include the establishment of a project File transfer Protocol site that will be used for the transfer of submittals. Due to the size and complexity of submittals emails shall not be used for submission.
 - b. Finish and/or product color samples shall not be submitted via electronic submittal unless previously approved.
 - c. Electronic submittals shall be composed into one Adobe PDF file with CSI section number and explanation, such as: **08800-01-glazing.pdf**.
- 5. Packaging: No matter what form of packaging each submittal is distributed in, e.g. envelope, box, crate, etc., each such packaging shall be properly identified with each addressee's company's name, address, and to whom specifically the package should be received by.

1.04 WORK RELATED SUBMITTALS

- A. General Requirement: Submit comprehensive and Project specific data.
- B. Product Data: When submission required by individual sections, in addition to other required data, submit all manufacturer's published information of required products including, but not limited to, general data, specifications, installation instructions, testing information, standard drawings and cut sheets, and color charts. Highlight mark all Project related data, when printed data on any page is not specific to Project required products. Write and draw *in* applicable information as indicated by printed or pictorial information when required to properly indicate compliance with requirements of Contract Documents.
 - 1. Submit Product Data in the following format:
 - a. PDF electronic file.
- C. Shop Drawings: When submission required by individual sections in addition to other required data, submit technical drawings with Project specific information of level and detail necessary to properly fabricate and erect work in accordance with Contract requirements, including proper coordination with other related work. Unless otherwise indicated, comply with following.
 - 1. Identification on Each Sheet: Include not less than following.
 - a. Architect's name and Architect's Project number.
 - b. Contractor's name.
 - c. Subcontractor's name.
 - d. Supplier's name.
 - e. Manufacturer name.
 - f. Detailer's Initial.
 - g. Date of Issue.
 - h. Space for revision date/description.

February 27, 2026

2. Referencing Details: Identify details by reference to sheet and detail numbers shown on Contract Documents. Where details shown are not on Contract Documents, they should be referenced to larger sections which can be clearly identified with work on Contract Documents.
 3. Dimensions: Distinguish field dimensions from those of the Contract Documents.
 4. Minimum Sheet Size for Drawings: 18" x 24".
 5. Drawing Types: Unless otherwise indicated, Drawings to include plans, elevations, sections, and details of the Work. Show with related work.
 6. Scale of Drawings: Provide a scale of a size not less than scale used on similar drawings on Contract Documents.
 7. Submit Shop Drawings in the following format:
 - a. PDF electronic file.
- D. Samples: When submission is required by individual sections, submit actual physical samples of the Work. Where not otherwise indicated, and required, comply with following.
1. Identical to Work: Samples to be identical, including for finish, as products required for the Work.
 2. Flat/Thin or Sheet Type Samples: Approximately 8-1/2" x 11" x thickness of material, or as otherwise acceptable to Architect.
 3. Running Samples: Profile by not less than 11-1/2" length.
 4. Color/Pattern Selection Process:
 - a. Process: Initial accurate (photo-like accuracy) color/pattern (not texture) charts may be submitted, followed by Architect selections from chart, followed by another submittal of actual samples of selections, followed by Architect's final selections, followed by final submittal of actual final samples.
 - b. Inaccurate Color Charts: Where color charts are submitted and Architect determines from comparison of actual samples that charts are not accurate enough in his estimation, the Architect reserves the right to request a single set of actual samples for each inaccurate chart of the full range of colors and patterns available; which shall be provided with no additional cost to the Owner.
 5. Texture: Submit the actual sample.
 6. Variation of Color/Texture: Where color and texture varies, provide not less than 5 samples indicating the full range of color/texture variation.
- E. Quality Control Submittals:
1. Items listed in specification sections under "Quality Control Submittals" Paragraph.
 2. Number of copies: Same number indicated in "Product Data" Paragraph above.
 3. Design data for Architect and Owner's Agent knowledge, as Contract Administrator for Owner. Information for limited purpose of assessing

conformance with information given and design concept expressed in Contract Documents.

4. Test reports for Architect's and Owner's Agent knowledge, as Contract Administrator for Owner. Information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.
 5. Certificates:
 - a. By manufacturer, installation/application subcontractor, or Contractor in quantities specified by Product Data.
 - b. Indicate material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
 - c. Certificates may be recent or previous test results on material or Product,, but must be acceptable to Architect.
 - d. From manufacturers for each product indicating materials supplied or installed are asbestos free.
 6. Manufacturers instructions for Architect's and Owner's Agents knowledge, as Contract Administrator for Owner.
 - a. Printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, to Architect/Engineer and Owner's Agent for delivery in quantities specified for Product Data.
 - b. Indicate special procedures, perimeter conditions requiring special attention and special environmental criteria required for application or installation.
 7. Manufacturer's field reports for Architect and Owner's Agent benefit, as Contract Administrator for Owner.
 - a. Submit report in duplicate within 30 days of observation for information.
 - b. Submit for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.
- F. Mockups: Except as otherwise specified, comply with following.
1. General: Not less than 4' x 8' minimum, constructed as independent samples (not part of Work); unless otherwise specified or acceptable to Architect.
 2. Supporting Structure: For independent mockups, provide an appropriate supporting structure, e.g. wood framing and plywood, that is capable of being moved without damage to mockup and that provides a suitable base for the attachment of the required mocked up materials.

1.05 MISCELLANEOUS SUBMITTALS

- A. General: Types as specified herein and referred to elsewhere in Contract Documents.
- B. Owner's Extra Stock and Maintenance Tools and Spare Parts:

1. Packaging: Package in heavy-duty boxes in sizes that are capable of being hand carried by two persons maximum. Heavy and easily damaged materials, e.g. tile and stone, are to be placed in wooden crates or containers. Materials that are easily damaged, such as tile, stone, etc. are to be packaged with polystyrene spacers or other materials to protect it from breakage.
2. Contents: Each package to contain one material type; unless otherwise acceptable to Architect.
3. Labeling: Fully label each package. Laser printed or similar quality readable printed labels to indicate product name, other descriptive product information, manufacturer name/address, and supplier name/address.

1.06 QUALITY ASSURANCE

- A. Coordination: In addition to other factors impacting timing of submissions sent to Architect, submittals are required to be successfully reviewed by Architect, prior to any purchase and fabrication of required Project products, unless otherwise acceptable to Architect.
- B. Identified Project Data: Submittals to be clearly identified for all Project specific requirements. Materials not properly identified may be returned for resubmittal.
- C. Responsibility: Where submittals are required to be signed, provide signatures of those who can legally bind the legal entity to the certifications or other requirements made in the submittals. Signatures to be scripted, typed, and include typed title of person, unless otherwise acceptable to Architect. Provide notarization when required or requested by Architect. It is up to the legal entity to assure that submittals provided by them have been signed by responsible persons; it is not the responsibility of the Architect to verify the signatures and therefore acceptance by the Architect of any signature submittals is not recognition by the Architect that such signatures are appropriate.
- D. Contractor's Review: Contractor is to fully review submittals prior to submission to Architect. Where review is not accomplished, even when stamped with review stamp, as evidenced by obvious data not marked for noncompliance, such submittals will be rejected.
- E. Architect's Review:
 1. Contractor's Responsibility: From time to time, the Architect may include review information that is the Contractor's responsibility. Such review information is provided solely to assist the Contractor as part of the review process. The Architect makes no claim to the accuracy of information provided and makes no claim to the Contractor's responsibility as defined by the Conditions of the Contract. The Contractor is solely responsible for all construction means, methods, techniques, sequences and procedures, and therefore shall be responsible for determining the accuracy of such information provided by the Architect and for its use in the Work.
 2. Review of Component vs. Complete Assembly: Architect's review of single component of a larger assembly does not constitute his approval of the entire assembly, unless otherwise indicated.

PART 2 - PRODUCTS

2.01 AVAILABLE PRODUCTS

- A. Intent: For each required Project product, unless specifically indicated, it is intended that the full range of characteristics, e.g. components, materials, colors, patterns, textures, finishes, be made available that is standard for the indicated quality of product required; for selection by the Architect and provided at no additional cost to the Owner for the Project.
- B. Submittals: Submit features to be selected by Architect.

PART 3 - EXECUTION

3.01 CONTRACTOR'S RESPONSIBILITIES – GENERAL

- A. Routing:
 - 1. General: Submit all required submittals to Architect, unless otherwise indicated.
 - a. Electronic submittals submit via E-mail and for large submittals submit via project FTP site.
 - 2. Owner's Extra Stock and Maintenance Tools and Spare Parts: Deliver to Owner's designated onsite locations.
- B. Substantiating Data: Submit substantiating data as requested by the Architect.
- C. Prior to Review: Verify field measurements and construction constraints.
- D. Review: Review all submittals prior to submission to Architect, including for coordination with field requirements. Indicate review by action stamp and signature.
- E. Deviations: Indicate significant deviations from Contract Requirements.
- F. Not to be Used for Work: Do not allow use of any submittal for fabrication and installation of Work for which successful review by Architect has not been completed as evidenced by Architect's signature action mark.
- G. Completeness and Piecemeal Submittals: Do not submit submittals that are not complete.
- H. Time of Submission:
 - 1. General: Submit submittals as soon as possible. Times for submission indicated herein are absolute minimums and Architect, Owner, and Consultant cannot guarantee that review can be accomplished within times indicated as their times are not strictly dedicated to this Project and have no control over the types and sizes of the submittals which also affect review time.
 - 2. The Contractor is solely responsible for properly sequencing submittals for proper work progress. However, Architect and Owner shall with reasonable promptness review all submissions required for their review and return them to the Contractor so as not to impede the progress of the Work.

3.02 CONTRACTOR'S RESPONSIBILITIES - WORK RELATED SUBMITTALS

- A. Time of Submission: Submit not less than ten (10) working days before dates reviewed submittals will be needed; fifteen (15) working days where Architect's Consultant required to review submittal. Review period shall commence on the Architect's receipt of the submittal.
- B. Returned for Incorporation: Pay for costs to return samples, mockups, and any other items to Contractor that may be required for Architect's review and are indicated for incorporation into the Work, if successfully reviewed by Architect.

3.03 CONTRACTOR'S RESPONSIBILITIES - MISCELLANEOUS SUBMITTALS

- A. Miscellaneous Submittals: As required in the respective Specification Sections.
- B. Other Required Submittals: As required by the Contract Documents or as otherwise required by the schedule of the Work.

3.04 ARCHITECT'S RESPONSIBILITIES

- A. Review: Review Contractor's submission with reasonable promptness. Indicate review by action mark. Return to Contractor.
- B. Review For:
 - 1. Completed of submittal.
 - 2. Review Contractor's review comments and marks for impact on design concept review.
 - 3. Review of compliance with design concept.

3.05 DISTRIBUTION FOR SUCCESSFULLY REVIEWED SUBMITTALS

- A. Shop Drawings and Product Data: Distribute successfully reviewed shop drawings and product data as follows.
 - 1. Contactor's file.
 - 2. Job site file.
 - 3. Record document's file.
 - 4. Subcontractor.
 - 5. Supplier.
 - 6. Fabricator.
- B. Samples: Job site file and as otherwise directed by the Architect.
- C. Mockups: Retain mockups at job site in protected storage areas for duration of Contract Period and protect from damage. Except for model rooms, remove and dispose of mockups in legal manner at end of Contract Period. Before removing from site, verify with Architect whether such mockups are required to be retained for a longer period.

February 27, 2026

3.06 REQUIREMENTS FOR UNSUCCESSFUL REVIEW & RESUBMISSION

- A. Format: Resubmit number. Indicate on letter of transmittal that submittal is a "RESUBMISSION" and indicate reference to previous submittal by number and date.
- B. Product Data and Samples: Resubmit with all required enclosures and either or both substantiating and additional data/samples as requested by the Architect.
- C. Shop Drawings: Resubmit revised Shop Drawings which are properly clouded, identified, and dated.
- D. Mockups: Adjust as directed by Architect, until successful review by Architect is achieved.

END OF SECTION

SECTION 01450 – QUALITY CONTROL

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Quality control inspection/testing requirements.
- B. Related Sections:
 - 1. Division 1 Sections.

1.02 SUBMITTALS

- A. From Testing Service:
 - 1. Testing Service Qualifications: Submit qualifications as required herein under “Quality Assurance” paragraphs.
 - 2. Test Reports: Laboratory to submit not less than four (4) copies of test reports to Architect. Include all information necessary to evaluate test, including following:
 - a. Date issued.
 - b. Architect’s Project Title and Number.
 - c. Testing Laboratory Name, Address, and Phone Number.
 - d. Inspector’s name and signature.
 - e. Date of each inspection and sampling.
 - f. Record of temperature and weather at time of each inspection and sampling.
 - g. Date of each test.
 - h. Identification of material/product tested with Specification Section.
 - i. Location of material/product and location of inspection or where samples taken.
 - j. Types of tests conducted.
 - k. Results of tests.
 - l. Evaluation and recommendations based on results of testing and inspections, including evaluation with respect to compliance with Contract requirements
- B. Testing Schedule: Submit schedule indicating when work is scheduled to be ready for types of testing required. Update schedule if changes occur and resubmit promptly to Architect to assure that inspections/testing can be accomplished when work is ready for testing.
- C. Mock Ups: Provide listing of all specified mock ups and their proposed schedule for review.

February 27, 2026

- D. Control Unit(s): Confirmation of control unit locations and elements to be constructed within.

1.03 QUALITY ASSURANCE

- A. Testing Service Qualifications:
 - 1. Meet "Recommended Requirements for Independent Laboratory Qualification", latest edition, published by American Council of Independent Laboratories.
 - 2. Meet basic requirements of ASTM E 329, "Standard of Recommended Practice for Inspection and Testing Agencies for Concrete and Steel as Used in Construction".
 - 3. Inspection Report: Submit copies of inspection report of facilities made by Materials Reference Laboratory of National Bureau of Standards during most recent tour of inspection; with memorandum of remedies of any deficiencies reported by inspection.
 - 4. Testing Equipment:
 - a. Calibration: Calibrate at 12-month intervals maximum by devices of accuracy traceable to either the National Bureau of Standards or accepted values of natural physical constraints.
 - b. Certificate of Calibration: Submit certificate of calibration made by accredited calibration agency.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 INSPECTIONS/TESTING, GENERAL

- A. General: Comply with requirements of the General Conditions of the Contract and requirements specified herein. Use of any testing service shall in no way relieve Contractor of his obligation to perform the Work in accordance with the Contract.
- B. Testing/Inspection Agency: Where Contractor is responsible for securing services of independent Testing/Inspection Agency, such Agency to be acceptable to Owner.
- C. Testing Owner Requires: Owner reserves right to test any and all work. If testing is desired by Owner, Contractor shall cooperate and provide appropriate access to site. Where date/timing is critical to testing requirements (as determined by Testing Agency), Contractor shall not deny appropriate access to test site by the Owner and at the Owner specified date/times, for any reason. Where date/timing is not as critical to test requirements, Owner will cooperate with Contractor to extent reasonably possible.
- D. Protection and Repair: Protect work exposed by or for testing service. Upon completion of inspection, testing, and sampling, repair damaged work and restore finishes to match the adjacent finishes.

E. Contract Conforming Work:

1. Resulting from Code Required Testing/Inspection:
 - a. Owner's Responsibilities: Pay for testing and inspections by an independent Testing/Inspection Service for tests and inspections required by Special Inspections.
 - b. Contractor's Responsibilities: Comply with following:
 - 1) Except for Special Inspections, pay for and secure testing and inspections from independent Testing/Inspection Service for all other testing and inspections required by Authorities and Code.
 - 2) At no cost to Owner, Contractor to provide for costs and work required to patch any damaged work; regardless of who pays for Testing/Inspection Service.
2. Resulting from Owner Required Testing/Inspection:
 - a. Owner's Responsibilities: Owner to pay for costs of Testing/Inspection Services and costs to patch any damaged work.
 - b. Contractors Responsibilities: Patch any damaged work.

F. Nonconforming Work:

1. Resulting from Code Required Testing/Inspection:
 - a. Owner's Responsibilities: Pay for initial costs for tests and inspections by an independent Testing/Inspection Service for tests and inspections required by Special Inspections.
 - b. Contractor's Responsibilities: Comply with following.
 - 1) Except for testing and inspections required by Special Inspections, pay for all other initial testing and inspections.
 - 2) Correct defective work to meet Contract requirements.
 - 3) Pay for all subsequent testing/inspection costs, until compliance with Contract requirements is achieved as evidenced by results of testing/inspections.
2. Resulting from Owner Required Testing/Inspection:
 - a. Owner's Responsibilities: None.
 - b. Contractor's Responsibilities:
 - 1) Initial Costs: Pay for initial testing/inspection costs and other fair costs, if any, incurred by the Owner and Architect which directly resulted from the testing/inspection requirements of the nonconforming work.
 - 2) Correction of Work: Correct defective work to meet Contract requirements. Pay for all subsequent testing/inspection costs, until compliance with Contract requirements is achieved as evidenced by results of testing/inspections.

- 3) Time Impact to Work: Requests for additional time will generally not be considered when resulting from installation of defective work.

3.02 MOCKUPS

- A. Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
 1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
 2. Notify Architect seven days in advance of dates and times when mockups will be constructed.
 3. Demonstrate the proposed range of aesthetic effects and workmanship.
 4. Obtain Architect's approval of mockups before starting work, fabrication, or construction.
 - a. Allow five days for initial review and each re-review of each mockup.
 - b. Maintain approved mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 5. Demolish and remove mockups when directed, unless otherwise indicated.
 6. When indicated in these Specifications, some mock-ups may become part of the work provided that they meet the requirements set forth in their respective specification sections and are approved by the Architect.

3.03 LABORATORY DUTIES:

- A. Cooperation: Cooperate with Architect. Ensure that personnel are at the site at the required times for inspections and testing.
- B. Personnel: Provide qualified personnel of appropriate experience and training necessary to carry out specific assigned duties.
- C. Performance of Service: Perform required inspections, sampling, and testing of materials and methods of construction. Ascertain compliance with requirements of Contract Documents as measured by standards required by specifications, by authorities, and by recognized ASTM and other acceptable industry standards.
- D. Notifications: Promptly notify Architect of irregularities or deficiencies of the inspected or tested Work.
- E. Test Reports Submittal: Execute inspections, sampling, and testing in prompt manner and submit test reports at times as prearranged with Architect.
- F. Additional Services: Perform as required by Architect.
- G. Limitations of Authority: Testing Service is not authorized to do the following.
 1. Release, revoke, alter, or enlarge on, requirements of Contract Documents.

2. Approve or accept any part of the Work.
3. Perform any duties of the Contractor.
4. Interfere in any way with the construction process, except as otherwise approved for performance of services contracted for.

3.04 CONTRACTOR'S RESPONSIBILITIES

- A. Contractor Notifications: Notify the Architect not less than five (5) working days prior to when work is ready for inspection/testing to allow for assignment of personnel and scheduling of testing service.
- B. Cooperation: Cooperate with testing service personnel. Provide appropriate access to work where inspections, sampling, and testing required. Furnish casual labor as necessary to provide access to work to be tested, to assist in obtaining and handling of samples at the site, and to otherwise facilitate the inspection and testing process.
- C. Contractor Arranged Tests: Contractor may arrange and pay for additional inspections, sampling, and testing from Owner's testing service when arranged through Architect.
- D. Non-complying Work: Where non-complying work is evidenced by a Testing Service, the Contractor at his option shall do one of following.
 1. Further Testing:
 - a. Testing Service and Methods of Testing: Secure and pay for further testing of non-complying work by another qualified testing service satisfactory to the Owner. Employ same test methods as testing service indicating noncompliance. Other test methods may be employed only when approved by Owner after review of alternate test proposals and justifications and only when previous test methods utilized can be shown to be inappropriate.
 - b. Results of Testing: Where results of testing indicates noncompliance, comply with requirements of paragraph 3.04 D.2., "Corrective Measures" as indicated. Where results indicate compliance, work with Architect in resolving problem expeditiously.
 2. Corrective Measures:
 - a. Owner's Costs Directly Attributable to Inspection/Testing Process: Pay for Owner's costs, including costs of all tests conducted, and other fair costs incurred by the Owner and the Architect.
 - b. Correction of Work: Provide all work necessary to correct defective work to comply with Contract requirements.

END OF SECTION

SECTION 01500 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.01 SUMMARY

- A. Requirements for temporary facilities and controls, including temporary utilities, support facilities, and security and protection facilities.
- B. Temporary utilities include but are not limited to, the following:
 - 1. Sanitary facilities, including toilets, wash facilities, and drinking water facilities.
 - 2. Lighting.
- C. Support facilities include, but are not limited to, the following:
 - 1. Storage and fabrication sheds
 - 2. Trash, refuse disposal.
 - 3. Construction aids and miscellaneous service and facilities
- D. Security and protection facilities and measures include, but are not limited to, the following:
 - 1. Environmental protection.
 - 2. Tree and plant protection.
 - 3. Barricades, warning signs, and lights.
- E. Related Sections: Refer to Divisions 2 through 16 for other temporary requirements including ventilation, humidity requirements and products in those Sections.

1.02 USE CHARGES

- A. General: Cost or use charges for temporary facilities are not chargeable to the Owner and shall be included in the Contract Price. Allow other entities to use temporary services and facilities without cost, including, but not limited to, the following:
 - 1. Other Contractors with agreements with the State working within the contract limits.
 - 2. Occupants of Project.
 - 3. Testing agencies.
 - 4. Owner's Representative and personnel of authorities having jurisdiction.
- B. Water Service: Use water from Owner's facilities existing water system without metering and without payment of use charges.
- C. Electric Power Service: Use electric power from Owner's existing system without metering and without payment of use charges.
- D. Sewer Service: Use sewer service from Owner's existing system without metering and without payment of use charges.
- E. Waste Receptacle Bins: Do not use facility's waste receptacle bins

1.03 SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.
- B. Temporary Utility Reports: Submit reports of tests, inspections, meter readings, and similar procedures performed on temporary utilities.
- C. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.
- D. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.
 - 1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.
 - 2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
 - 3. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.
- E. Landfill Disposal Receipts: Submit copies of receipts issued by a landfill facility. Include receipts with Contractor Daily Progress Report and part of the Construction Waste Management Plan.

1.04 QUALITY ASSURANCE

- A. Standards: Comply with IBC Chapter 33, "Safeguards During Construction", ANSI A10.6, NECA's "Temporary Electrical Facilities", and NFPA 241, "Construction, Alteration, and Demolition Operations".
 - 1. Trade Jurisdictions: Assigned responsibilities for installation and operation of temporary utilities are not intended to interfere with trade regulations and union jurisdictions.
 - 2. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70, "National Electrical Code".
 - a. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.05 PROJECT CONDITIONS

- A. Conditions of Use: The following conditions apply to use of temporary services and facilities by all parties engaged in the Work:
 - 1. Keep temporary services and facilities clean and neat.
 - 2. Relocate temporary services and facilities as required by progress of the Work.

1.06 PREPARATION AND PROTECTION

- A. Protection of Property: Continually maintain adequate protection of the Work from damage and protect all property, including but not limited to buildings, equipment, furniture, grounds, vegetation, material, utility systems located at and adjoining the job site. Repair, replace or pay the expense to repair damages resulting from Contractor's fault or negligence.
- B. Before starting work to be applied to previously erected constructions, make a thorough and complete investigation of the recipient surfaces and determine their suitability to receive required additional construction and finishes. Make any repair that is required to properly prepare surfaces and coordinate the Work to provide a suitable surface to receive following Work.
- C. Commencing work by any trade implies acceptance of existing conditions and surfaces as satisfactory for the application of subsequent work, and full responsibility for finished results and assumption of warranty obligations under the Contract.
- D. Protect existing (including interiors) work to prevent damage by vandals or the elements. Provide temporary protection. Use curtains, barricades, or other appropriate methods. Take positive measures to prevent breakage of glass and damage to plastic, aluminum and other finishes.
- E. Repairs and Replacements: Promptly replace and repair damages to the approval of the Owner's Representative. Additional time required to secure replacements and to make repairs does not justify a time extension.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. General: Provide new materials. Undamaged, previously used materials in serviceable condition may be used if approved by Architect. Provide materials suitable for use intended.

2.02 TEMPORARY FACILITIES

- A. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
 - 1. Store combustible materials apart from building.
- B. Barriers and Enclosures:
 - 1. Barricades: Provide and maintain barriers and warning signs as required to prevent public entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations. Barricades shall made of plywood and painted per Owner's color scheme and apply signage and/or graphics as directed/provided by Owner.
 - 2. Provide temporary partitions and ceilings as required to separate work areas from Owner occupied areas, to prevent penetration of dust and moisture into Owner occupied areas, to prevent damage to existing areas and equipment.

February 27, 2026

3. Pedestrian Walkways: Pedestrian walkways adjacent to fence to be protected when required by Authorities.
4. Safety Signage: Provide signage as required for the safety and notification of the Public.
5. Removal: Remove from site when no longer necessary and when acceptable to Architect.

2.03 EQUIPMENT

- A. Self Contained Combination Toilet and Urinal Units: Single occupant units of chemical, aerated recirculation, or combustion type; vented; fully enclosed with a glass fiber reinforced polyester shell or similar nonabsorbent material. One quarter of, or at least one unit(s) shall contain a handwash sink with potable water storage.
- B. Electrical Outlets: Properly configured, NEMA polarized outlets to prevent insertion of 110 to 120 V plugs into higher voltage outlets; equipped with ground fault circuit interrupters, reset button, and pilot light.
- C. Power Distribution System Circuits: Where permitted and overhead and exposed for surveillance, wiring circuits, not exceeding 125 V ac, 20 A rating, and lighting circuits may be nonmetallic sheathed cable.

PART 3 - EXECUTION

3.01 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.
- B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.02 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary services.
 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Storm and Sewer Drainage: If sewers are available, provide temporary connections to remove effluent that can be discharged lawfully. If storm drains are not available or cannot be used, provide drainage ditches, dry wells, stabilization ponds, and similar facilities. If neither sewers nor drainage facilities can be lawfully used for discharge of effluent, provide containers to remove and dispose of effluent off site in a lawful manner.
 1. Filter out excessive soil, construction debris, chemicals, oils, and similar contaminants that might clog sewers, storm drains or pollute waterways before discharge.

February 27, 2026

2. Connect temporary sewers, if used as directed by sewer department officials.
 3. Maintain temporary sewers and drainage facilities in a clean, sanitary condition. After heavy use, restore normal conditions promptly.
 4. Provide temporary filter beds, settlement tanks, separators, and similar devices to purify effluent to levels acceptable to authorities having jurisdiction.
- C. Water Service for Construction Site: Water Service: A temporary tap into the facility's existing water system is allowed, subject to the following conditions:
1. Comply with the Department of Health's and County water provider's requirements when tapping into the existing water system.
 2. Reasonable amounts of water will be available without charge.
 3. Should the Contractor at any time fail to comply with any or all of the above conditions, the Owner may terminate the use of water. The Contractor shall remove the hookup within 48 hours of notification of such termination.
- D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water fixtures. Comply with regulations and health codes for type, number, location, operation, and maintenance of fixtures and facilities.
1. Disposable Supplies: Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Maintain adequate supply. Provide covered waste containers for disposal of used material.
 2. Wash Facilities: Install wash facilities supplied with potable water at convenient locations for personnel who handle materials that require wash up. Dispose of drainage properly. Supply cleaning compounds appropriate for each type of material handled.
 3. Locate toilets and drinking water fixtures so personnel need not walk more than 2 stories vertically or 200-feet horizontally to facilities.
- E. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
1. Provide dehumidification systems when required to reduce substrate moisture levels to level required to allow installation or application of finishes.
- F. Electric Power Service: Use of Owners facilities electrical power services will be permitted as long as equipment is maintained in a condition acceptable to the Owner and so long as the power demand does not exceed existing system capabilities or interfere with the facilities operations.
- G. Electric Distribution: Provide receptacle outlets adequate for connection of power tools and equipment. Protect wiring, in conduits or other, measures when exposed to possible damage or traffic areas.

February 27, 2026

- H. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations and traffic conditions.
- I. Telephone Service: Provide a portable wireless telephone with voice-mail or messaging service for superintendent's use in making and receiving telephone calls when at the construction site.

3.03 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
 - 1. Locate Storage sheds, sanitary facilities, and other temporary construction and support facilities for easy access or where shown on Contract Drawings or as directed by the Owners Representative.
 - 2. Maintain support facilities until near Substantial Completion. Remove before Substantial Completion.
- B. Temporary Sign(s):
 - 1. Provide and install temporary signs as listed. Sign designs are attached to Part 3 of this Section:
 - a. Warning Sign
 - 2. Install signs where directed by the Owner's Representative or where indicated to inform public and persons seeking entrance to the Project. Do not permit installation of unauthorized signs.
 - 3. Provide temporary signs to provide directional information to constructional personnel and visitors.
 - 4. Construct signs with durable materials, properly supported or mounted, and visible.
- C. Trash, Refuse Disposal: Coordinate the disposal of trash and refuse with the requirements of Section 01595 – PROJECT CLEANING.
 - 1. Department of Health – Illegal Dumping Notice. See attachment to Part 3 of this section.
 - a. This Notice to be printed out on 8.5x11" paper.
 - b. This Notice to be posted at the job site field office and/or in locations visible to all contractors, subcontractors, suppliers, vendors, etc. throughout the duration of the project.
 - 2. Illegal Dumping of solid waste could subject the Contractor to fines and could lead to felony prosecution in accordance with Chapter 342H, HRS. For more information, see the following web site:
<http://www.hawaii.gov/health/environmental/waste/sw/pdf/Illdump.pdf>
 - 3. Provide waste collection containers in sizes adequate to handle waste from construction operations. Containerize and clearly label hazardous, dangerous, or unsanitary waste materials separately from other waste.
 - 4. Do not burn debris or waste materials on the project site.
 - 5. Do not bury debris or waste material on the project site unless specifically allowed elsewhere in these specifications as backfill material.

February 27, 2026

6. Haul unusable debris and waste material to an appropriate off site dump area.
 - a. Water down debris and waste materials during loading operations or provide other measures to prevent dust or other airborne contaminants.
 - b. Vacuum, wet mop, or damp sweep when cleaning rubbish and fines which can become airborne from floors or other paved areas. Do not dry sweep.
 - c. Use enclosed chutes or containers to conveying debris from above the ground floor level.
7. Clean up shall include the collection of all waste paper and wrapping materials, cans, bottles, construction waste materials and other objectionable materials, and removal as required. Frequency of clean up shall coincide with rubbish producing events.
- D. Existing Elevator Use: Use of Owner's existing elevators will be permitted, provided elevators are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore elevators to condition existing before initial use, including replacing worn cables, guide shoes, and similar items of limited life.
 1. Do not load elevators beyond their rated weight capacity.
 2. Provide protective coverings, barriers, devices, signs, or other procedures to protect elevator car and entrance doors and frame. If, despite such protection, elevators become damaged, engage elevator Installer to restore damaged work so no evidence remains of correction work. Return items that cannot be refinished in field to the shop, make required repairs and refinish entire unit, or provide new units as required.
- E. Existing Stair Usage: Use of Owner's existing stairs will be permitted, provided stairs are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore stairs to condition existing before initial use.
 1. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If stairs become damaged, restore damaged areas so no evidence remains of correction work.

3.04 ENVIRONMENTAL CONTROLS

- A. General: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
- B. Dust Control:
 1. Prevent dust from becoming airborne at all times including non working hours, weekends and holidays in conformance with the State Department of Health, Administrative Rules, Title 11, Chapter 60.1 Air Pollution Control.
 2. Contractor is responsible for and shall determine the method of dust control. Subject to the Contractor's choice, the use of water or

February 27, 2026

environmentally friendly chemicals may be used over surfaces that create airborne dust.

3. Contractor is responsible for all damage claims due to their negligence to control dust.

C. Noise Control

1. Keep noise within acceptable levels at all times in conformance with the State Department of Health, Administrative Rules, Title 11, Chapter 46 Community Noise Control. Obtain and pay for the Community Noise Permit when construction equipment or other devices emit noise at levels exceeding the allowable limits.
2. Ensure mufflers and other devices are provided on equipment, internal combustion engines and compressors to reduce loud disruptive noise levels and maintain equipment to reduce noise to acceptable levels.
3. Unless specified elsewhere, do not start construction equipment that meet allowable noise limits prior to 6:45 A.M. or equipment exceeding allowable noise levels prior to 7:00 A.M.

D. Odor Control

1. Implement odor control and elimination measures prior to and during the application of the roofing, waterproofing and painting materials. Control/elimination measures shall be field tested at off-hours and consists of the following measures:
 - a. Sealing of air intakes with activated carbon filters. Install filters in accordance with requirements and recommendations of the filter manufacturer. Seal filters at joints and against building exterior walls to prevent leakage of unfiltered air where required due to size of intake opening. Provide track system to secure filters.
 - b. Protection of Contractor personnel and occupants of the structure and surrounding buildings as necessary to comply with requirements of OSHA, NIOSH and/or governing local authority.
2. When disposing of all refuse or unused materials, observe all EPA, OSHA or local disposal requirements.

3.05 BARRICADES AND ENCLOSURES

- A. Barricades: Provide complete construction fencing with dust screening around the building site. Contractor will be responsible in maintaining the fence and gates and will be required to remove the fencing around the site prior to turnover.
1. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Provide Owner's Representative with 2 sets of keys.
 2. Maintain temporary construction barricade(s) throughout the duration of the Work, assume frequent repairs due to strong wind exposure. During the course of the project, the Owner's Representative may require additional barricades be provided for the safety of the public. Contractor shall erect the additional barricade(s) at its own expense.

February 27, 2026

B. Temporary Enclosures:

1. Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
2. Where cooling is needed and permanent enclosure is not complete, provide insulated temporary enclosures. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.

C. Opening Protection

1. Vertical Openings: Close openings with plywood or similar materials.
2. Horizontal Openings: Close openings in floor or roof decks and horizontal surfaces with load bearing, wood framed construction.

3.06 TEMPORARY FIRE PROTECTION

- A. Store combustible materials in containers in fire safe locations.
- B. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways, and other access routes for firefighting. Prohibit smoking in hazardous fire exposure areas.
- C. Supervise welding operations, combustion type temporary heating units, and similar sources of fire ignition.
- D. Develop and supervise an overall fire prevention and first aid fire protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

3.07 OPERATION, TERMINATION, AND REMOVAL

- A. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage caused by heat and similar elements.
- B. Termination and Removal: Remove each temporary facility when need for its service has ended, or when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
 1. Materials and facilities that constitute temporary facilities are the property of Contractor. The Department reserves the right to take possession of Project identification signs.

3.08 ATTACHMENTS

- A. Department of Health – Illegal Dumping Notice

END OF SECTION

HAWAII HEALTH SYSTEMS CORPORATION – KAUAI DIVISION

SMMH Emergency Department Renovation & Addition
Project No. 225057-01

Temporary Facilities and Controls
01500 - 9

**DEPARTMENT OF HEALTH
ILLEGAL DUMPING NOTICE**

The law requires you to dispose solid waste only at recycling or disposal facilities permitted by the Department of Health.

“Solid waste” includes municipal refuse, construction and demolition waste, household waste, tires, car batteries, derelict vehicles, green wastes, furniture, and appliances.

**Illegal dumping of solid waste
or allowing illegal disposal of solid waste on your property even if contractual or other
arrangements are made could subject you to fines from \$10,000 to \$25,000 per occurrence
and could lead to felony prosecution
in accordance with Chapter 342H, HRS.**

**Contact the Department of Health,
Solid Waste Section at 586-4226
to report illegal dumping activities
or if you have further questions.**

DIVISION 01 – GENERAL REQUIREMENTS

SECTION 01570 – SOIL EROSION CONTROL

PART 1 -GENERAL

1.01 RELATED DOCUMENTS

A. Related Work Described Elsewhere:

1. Section 02100 - SITE PREPARATION
2. Section 02300 - EARTHWORK
3. Erosion Control Plan
4. NPDES Notice of General Permit Coverage (NGPC) for the Project

1.02 DESCRIPTION

- A. Work under this section consists of furnishing all labor, materials and equipment required to complete the approved Erosion Control Plan per Federal, State and County Code requirements and as shown in the Drawings, the temporary control measures as required by these Specifications, or as ordered by the Owner's Representative during the life of the Contract to control dust and water pollution. Control of dust and water pollution shall be through the use of silt fences, filter socks, stabilized construction entrance/exit, dust fences, watering, snake bags and/or other erosion control devices or methods.
- B. Temporary erosion and siltation control measures as described herein shall be applied to any erodible material within this project, including local material sources, stockpiles and work areas.
- C. The Contractor shall be responsible for removing all silt and debris resulting from his work and deposited in drainage facilities, roadways, neighboring lands, and other areas.
- D. All costs incurred in complying with the provisions of this Section shall be borne by the Contractor.

1.03 SUBMITTALS

- A. Best Management Practice (BMP) Plan: The Contractor shall provide a letter indicating conformance to the Erosion Control Plan as shown in the Drawings or provide a written, site-specific BMP plan describing activities to minimize water pollution and soil erosion into County and State waters and/or drainage systems. The BMP plan shall conform to the requirements of the "Interim Construction Best Management Practices (BMP's) for Sediment and Erosions Control for the County of Kauai", and the "National Pollutant Discharge Elimination System Permit" as part of HAR Chapter 11-55, and inclusive of all references.

PART 2 -PRODUCTS

2.01 MATERIALS

- A. Following are standard traditionally provided approaches, contractor to provide at a minimum these along with additional facilities to comply with standards and codes. Runoff to adjacent properties shall be strictly prohibited and controlled.
1. Silt fences shall be constructed with an ultraviolet (UV) resistant geotechnical filter fabric, stapled or secured to wood or metal posts embedded into the ground.
 2. Snake bags shall be constructed with a UV resistant geotechnical filter fabric filled with gravel.
 3. Filter socks shall be constructed with a UV resistant geotechnical filter fabric, filled with an Environmental Protection Agency (EPA) or State Department of Health (DOH) acceptable compost material.
 4. Dust fence shall be 12-feet high with galvanized pipe posts and tension wires. The dust fence cloth shall be a UV resistant fabric, hunter green in color.
 5. Stabilized construction entrance/exit shall be constructed with 1-inch to 3-inch course aggregate, 12-inches minimum thickness over a geotechnical filter fabric.
 6. Mulches may be bagasse, hay, straw, fiber mats, netting, wood cellulose, bark, wood chips, or other suitable material acceptable to the Owner's Representative and shall be reasonably clean and free of noxious weed and deleterious materials.

Mulch shall be specially processed fiber containing no growth or germination inhibiting factors. It shall be such that after addition and agitation in the hydraulic equipment with seed, fertilizer, water and other additives not detrimental to plant growth, the fibers will form a homogeneous slurry. When hydraulically sprayed on the soil, the fibers shall form a blotter-like ground cover which readily absorbs water and allows infiltration to the underlying soil. In every application, complete coverage of the soil shall be attained. Mulch shall be applied at the minimum rate of 1,500 pounds per acre.
- B. Slope drains may be constructed of pipe, fiber mats, rubble, Portland cement concrete, bituminous concrete, plastic sheets, or other material acceptable to the Owner's Representative.
- C. Grass shall be a quick growing species (such as rye grass, Italian rye grass, or cereal grasses) suitable to the area and which provide a temporary cover that does not later compete with the permanent cover.
1. The grass shall be obtained by digging up luxuriant growths from areas that are free of seeds, roots, plants, and grasses that are foreign to the specified

grass. The grass will not be acceptable unless it is planted and watered within 24 hours after being dug out from its original growing position.

2. Seed for hydro-mulching, unless otherwise specified, shall be Bermuda (Cynodon Dactylon) except giant varieties, certified, meeting the following requirements:

Pure Seed	95% minimum
Crop Seed	1% maximum
Weed	0.5% maximum
Inert Material	5% maximum
Germination	85% minimum

The seeds shall be applied at the rate of 100 pounds per acre (minimum) and within twelve (12) months of the date of the certified germination test.

D. Fertilizer

1. Fertilizer and soil conditioners shall be a standard commercial grade acceptable to the Owner's Representative.
2. The Contractor shall be responsible to determine the proper fertilizer required in the hydro-mulch mix for the existing soil condition. He shall be responsible to decide the quantity and the analysis and ratio to insure sufficient nutrients for the sustained growth of the grass.

PART 3 -EXECUTION

- 3.01 The Contractor shall install all erosion control measures shown in the Drawings, including stabilized construction entrance/exit , silt fences and dust fences, before any clearing, grubbing or earth moving work is initiated. The erosion control measures may be modified as necessary to adjust to field conditions that develop as the construction work progresses.
- 3.02 Except for specified erosion control measures shown in the Drawings, the Contractor shall determine additional erosion control measures to use as the construction work progresses. Such measures may involve scheduling of the construction activities to minimize the erosion potential, the construction of temporary berms, dikes, dams, sediment basins, and slope drains, and the use of temporary mulches, mats, and grassing, or the construction and use of other control devices or methods as necessary to control erosion.
- 3.03 All erosion control measures shall be checked, maintained, cleaned and repaired throughout the duration of the construction period. As a minimum, erosion control measures should be checked weekly in dry periods and within twenty-four hours after any rainfall of 0.5 inches or greater within a 24-hour period. During prolonged rainfall, the erosion control measures should be checked daily. If heavy rains are projected, all erosion control measures should be inspected immediately and reinforced as necessary.

- 3.04 The maximum surface area of earth material exposed by clearing, grubbing, borrow and fill operations at any time is 1.5 acres. The Owner's Representative has the authority to limit the surface area exposed by clearing and grubbing and to limit the surface area exposed by excavation, borrow and fill operations. The Owner's Representative may also direct the Contractor to provide immediate, permanent, or temporary pollution control measures to prevent contamination of drainage channels and pipes, roads, neighboring lands, and other areas.
- 3.05 The Contractor shall limit the surface area exposed by grubbing, stripping of topsoil, and grading to that which is necessary for to perform the next operation and which is within his capability and progress in keeping the finish grading, mulching, grassing, and other such pollution control measures current.
- 3.06 The Contractor shall conduct his operations so that excavation, embankment and imported materials shall be dampened with water on a continual basis to prevent dust problems. The Contractor shall limit the amount of water sprayed for dust control to ensure that the water evaporates or infiltrates with no runoff.
- 3.07 The Contractor shall, at the end of each work operation in any one day, shape the earthwork in such a manner as to control and direct the runoff of rainwater to minimize the erosion of soils. He shall construct earth berms along the top edges of embankments or along any critical area within the project, such as along the property line with adjacent properties, streams, and water channels, to intercept any runoff. Temporary slope drains shall be provided to carry runoff from the top of cuts and fills. Temporary facilities for controlled discharges shall be provided for runoff impounded, directed, or controlled by project activities or by any erosion control measure employed.
- 3.08 Cut and fill slopes shall be shaped, topsoiled and planted, if necessary or shown on the Drawings, as the work progresses. Whenever major earthwork is suspended or halted and the slope is bared, the exposed surfaces shall be hydro-mulch seeded or protected as directed by the Owner's Representative at the Contractor's expense.
- 3.09 Construction of berms, cofferdams, or other such construction in or near the vicinity of waterways, or other bodies of water shall be of approved materials.
- 3.10 Damages caused by the erosion of soils and the pollution of downstream areas shall be the responsibility of the Contractor and all costs for repairing, correcting, replacing, and cleaning such damaged or polluted facilities shall be borne by the Contractor.
- 3.11 Grassing for erosion control of erodible areas can be undertaken by sprigging, matting or hydro-mulch seeding.

A. Sprigging or Matting

- 1. Ground Preparation: Prior to planting, the areas to be grassed shall be cleared of all unwanted plants (including their root systems), stones over three (3) inches in diameter, papers, trash and debris.

If the existing soil in the areas to be grassed is suitable for use as topsoil, the soil shall be scarified to a depth of six (6) inches from the finished surface, and worked until it is of a uniform and loose texture.

February 27, 2026

Areas unsuitable for planting shall be finished with a 4-inch layer of topsoil, spread and graded to conform to the finish grade shown on the Drawings.

2. Planting: Planting shall be by sprigging, matting, or other methods at the option of the Contractor. If planting is by sprigging or matting, the surface shall be rolled with a suitable lawn roller after planting has been completed.
3. Water shall be applied within the same day of planting in such quantities as to moisten the soil to the depth of the planted grass. Additional application shall be made so that the planted areas are continually kept damp to the grass depth and until the commencement of plant establishment work.
4. Fertilizer shall be applied at not less than the rate of 300 pounds per acre, 23 to 30 days after the grass has been planted.

B. Hydro-Mulch Seeding

1. The Contractor shall begin hydro-mulch seeding operations after the areas prepared or designated for seeding have been approved by the Owner's Representative. Approval shall include inspection of slopes to insure provision has been made for the collection and disposal of surface water to protect planted areas from erosion. Approval shall not relieve the Contractor of his responsibility to restore any damage to the slope or planted areas not yet accepted by the State.
2. The hydro-mulch equipment shall be capable of mixing all the necessary ingredients to a uniform mixture and of applying the slurry to provide uniform coverage. Seed, fertilizer, and mulch mix shall be applied in one operation by approved hydraulic equipment.
3. Areas inaccessible to hydro-mulching application shall be seeded, fertilized and mulched by hand methods.
4. Water shall be applied immediately following mulching in such quantities as to moisten the soil and mulch. Watering shall be continued in such manner, quantity, and frequency to insure proper germination and growth and shall be done in a way that will prevent erosion and will not cause damage to the planted areas.

END OF SECTION

SECTION 01595 – PROJECT CLEANING

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Cleaning during construction.
 - 2. Final Project cleaning.
- B. Related Sections:
 - 1. Division 1 Sections, general.
 - 2. Section 01500 - CONSTRUCTION FACILITIES & TEMPORARY CONTROLS.
 - 3. Section 01700 - CONTRACT CLOSEOUT.
 - 4. Divisions 2 through 16 Sections.

1.02 DEFINITION

- A. Clean: Unless otherwise acceptable to the Architect, a surface shall be deemed clean when the following conditions have been met at time of inspection.
 - 1. Dust and debris removed.
 - 2. No evidence of damage, mars, stains, or contaminants on surface.
 - 3. Finish is in accordance with Contract requirements.

1.03 SUBMITTALS

- A. Quality Assurance Submittals: Refer to “Quality Assurance” paragraphs herein.

1.04 QUALITY ASSURANCE

- A. Cleaning Program: Submit a cleaning program to be submitted to all Entities that are to deliver and install work on Project Site. Indicate general and Entity specific requirements. Program to include, but not be limited to, following.
 - 1. Extent of cleanup.
 - 2. Frequency of cleanup.
 - 3. Responsibilities for removal of waste materials from Site.
 - 4. Methods for use and removal of hazardous materials.
 - 5. Precautions for use of materials and methods which can damage Project materials.
 - 6. Location of trash dumpsters for general use.
 - 7. Owner specific requirements.
- B. Off Site Areas:

February 27, 2026

1. General: Generally keep off Site areas, e.g., Owner's off Site areas, and adjacent Public and private property, free from debris and other waste materials which are generated by Contractor's operations.
 2. Owner's Property: Immediate perimeter areas to be cleaned daily. Areas along paths where vehicles have dropped or tracked in mud, dirt, and other materials to be cleaned on regular basis, including washing of streets and other public access ways.
- C. Damages:
1. Project: Cleaning methods and materials which damage-installed products are to be rectified to satisfaction of Architect. When acceptable to Architect, minor damages may be restored where evidence of restoration is not evident and where restoration does not affect long term performance and aesthetics of product; otherwise replace damaged materials with Contract complying new materials.
 2. Off Site: Replace or restore damaged materials to satisfaction of affected parties.
- D. Special Requirement - Glass: Glass scratched by sharp cleaning implements, e.g. razor blades, etc., is to be considered as damage to glass products. Generally, scratched glass products are to be replaced with new Contract complying materials. Buffing out of such scratches will generally not be allowed, except for only very minor areas and only when acceptable to Architect.

PART 2 - PRODUCTS

2.01 CLEANING MATERIALS

- A. General: Use only cleaning materials recommended by the Manufacturer of the product to be cleaned. Use cleaning materials only on surfaces recommended by Cleaning Material Manufacturer. Do not use any cleaning material, including acid products for cleaning purposes where surface finish, color, and texture can be altered.

PART 3 - EXECUTION

3.01 CLEANING REQUIREMENTS, GENERAL

- A. Project Conditions: Maintain Project in orderly and clean manner at all times. Protect Project from exposure to any hazardous and unsafe conditions. Comply with requirements of the authorities and insurance.
- B. Use of Cleaning Materials: Comply in strict accordance with Cleaning Material Manufacturers instructions. Provide adequate ventilation when necessary, including during use of volatile or noxious materials. Store unused materials in proper containers. Store toxic and volatile products in secure location and in manner to prevent any unsafe conditions.
- C. Methods of Cleaning: Utilize cleaning methods which are recognized by the industry as appropriate for surfaces to be cleaned. Utilize least destructive methods to accomplish appropriate cleaning. Where methods may be destructive to material, to its finish, color, or texture, secure approval from Architect. Where

February 27, 2026

cleaning materials are used, comply in strict accordance with Cleaning Material Manufacturer's requirement.

- D. Personnel: Personnel to be skilled and experienced for each type of cleaning required.
- E. Trash, Refuse Disposal: Comply with requirements specified in Section 01500 - CONSTRUCTION FACILITIES & TEMPORARY CONTROLS.

3.02 DURING CONSTRUCTION

- A. General:
 - 1. Loose Waste: Execute cleaning in an orderly and systematic manner to ensure that building, grounds, and adjacent public properties are maintained free from accumulations of waste materials and rubbish generated by the ongoing construction process.
 - 2. Deleterious Products on Work: Maintain cleanliness of installed work, whenever required, to ensure that substrates are not permanently marred or stained and to prevent deleterious products from damaging or deteriorating the installed work.
- B. Regular Cleanup: At reasonable intervals or when necessary, institute cleaning process.
- C. Collection Containers: Provide collection containers as required for proper disposal of waste resulting from their ongoing work. Owner's trash dumpsters are not to be used.
- D. Dust Producing Materials:
 - 1. General: Prevent excessive dust pollution and contamination of adjacent finishes.
 - 2. Site Soil Borne Dust: wet down dry dust. Conduct operations to prevent hazards and damages by watering procedures. Where watering procedures are not appropriate, provide temporary enclosure of operation.
- E. Dropping/Throwing: Do not drop or throw materials any distance which would create a hazard or cause dust pollution. Provide appropriate chutes, including enclosures when required.

3.03 AT TIME OF SUBSTANTIAL COMPLETION INSPECTION

- A. Work to be Inspected: All Work to be inspected to have been fully cleaned by time of inspection. Cleaning to be scheduled so that surfaces can be inspected in clean condition.
- B. Restorations: Any Work to be inspected which had been damaged, marred, or contaminated, to have been fully restored to Contract requirements at time of inspection.
- C. Concealed Spaces: Remove dust and debris from concealed spaces which are accessible.
- D. Contractor's Equipment/Materials: Remove all evidence of Contractors equipment/materials and other Work, except that which is necessary for completion of unfinished Work, if any.

February 27, 2026

3.04 AT TIME OF FINAL INSPECTION

- A. General: Comply with same procedures stated for “Substantial Completion Inspection”, except for Work certified by Architect and which remained unaffected by the Contractor’s ongoing operations in other areas.

END OF SECTION

SECTION 01600 – MATERIAL AND EQUIPMENT

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. General requirements for products.
- B. Related Sections:
 - 1. Division 01 Sections, general.

1.02 DEFINITIONS

- A. Manufacturer: Where not otherwise indicated within a specifications section, reference to the “manufacturer” shall refer to the primary product manufacturer of that section.

1.03 SYSTEM DESCRIPTION

- A. Performance: Each product provided shall perform to the Contract requirements under the anticipated conditions of use and installation. Performance evaluation of any product to include the performance of the product by itself and its performance relative to the total assembly for which it is a part.

1.04 SUBMITTALS:

- A. General: Refer to Division 1 requirements and individual specification sections.
- B. List of Products:
 - 1. Format: Prepare a typewritten list of the principal products in a form acceptable to the Architect. For each product, provide and organize information in columns for each of the following headings.
 - a. Related unit-of-work specification section number.
 - b. Generic names as used in contract documents or where not indicated as commonly accepted.
 - c. Proprietary name and product designation number.
 - d. Manufacturer’s name, address, phone number, Project assigned representative.
 - e. Supplier’s name, address, phone number, company representative for Project.
 - f. Installer’s name, address, phone number, primary trade of workmen, and Project assigned representative.
 - g. Projected delivery date and time span of delivery period.
 - 2. Initial Submittal: Submit within 30 calendar days from date of commencement

of the Work. Submit a list of those products that must be established early in the Contract Period. The complete list may also be submitted at the Contractor's option.

3. Completed List: Submit within 60 calendar days from date of commencement of the Work.
4. Qualifications to List: For each list submitted, provide typewritten explanations of omissions of data and explanations of why any products deviate from Contract requirements.
5. Architect's Review/Action: Review list within 15 working days. For each item, indicate one of the following written responses.
 - a. "No Reasonable Objection": Indicates that products may be incorporated into the Work subject to compliance with Contract requirements.
 - b. "Objection": Indicates that products may not be incorporated into the Work. Architect to provide qualifying explanation for rejection.
 - c. "Deferred Action": Indicates that products require further data for proper evaluation by Architect. The Contractor shall secure data as required and submit this to the Architect. Architect to act on "deferred action" items in timely manner.
6. Coordination: Incorporate delivery date and time span of delivery data for products in progress schedules. Refer to Section 01040 - Coordination.

1.05 QUALITY ASSURANCE

- A. Product Appearance:
 1. Intent: Appearance of products for any work exposed to view in final finished work is critical to Design intent of Architect.
 2. Requirement: Secure written verification of finishes, e.g., colors, patterns, textures, matching, etc., before any purchase, fabrication, and installation of any such products.
- B. Manufacturer, Supplier, Fabricator, Installer Experience: Except as otherwise indicated or acceptable to the Architect, any entity furnishing, installing, or furnishing/installing products shall not have less than three (3) years minimum current experience with the required products and services being provided. Such services and products shall have also been provided for not less than three (3) current successful projects of similar scope.
- C. Product Source Control: Maintain the original products furnished for this Project throughout the Contract Period. Do not change to other generically similar products, unless otherwise acceptable to the Architect.
- D. Stored Products: Assume full responsibility for protection and safekeeping of products stored on and off premises during Contract Period. Maintain insurance as required for full replacement value of all products as stored and in locations stored.
- E. Deviations from Contract Requirements: Refer to Section 01010 - Summary of Work.

February 27, 2026

- F. Fire Rated Assemblies: Where fire-rated assemblies are indicated, provide composite assemblies that strictly conform to each Product Manufacturer's laboratory tested assemblies that conform to the Contract requirements, comply with the applicable codes, and are acceptable to the Authorities.

PART 2 - PRODUCTS

2.01 MANUFACTURER

- A. Available Manufacturers: Comparable products of other Manufacturers may be incorporated into the Work when such products comply with the following.
 - 1. Are acceptable to the Architect.
 - 2. Contract requirements do not specifically indicate "no substitution", or "provide one of the following only", or other similar language to this effect.

2.02 PRODUCTS, GENERAL

- A. Compliance with Requirements: All products provided for this Project shall comply with Contract requirements.
- B. Assembly of Products: Each interfacing product in an assembly shall be verified for its Project appropriateness relative to its use and appropriateness to any interfacing product in the assembly. Do not provide products which do not comply with this requirement and are not acceptable to the Manufacturer's of the interfacing products.
- C. Dimensional Coordination: Where dimensional tolerances indicated on Contract Drawings differ from products to be provided, notify Architect of such differences.
- D. Environmental Requirements: Maintain types of environmental conditions required for each product as recommended by the Product Manufacturer for the specific Project conditions.

2.03 SPECIAL PRODUCT REQUIREMENT:

- A. Galvanizing of Ferrous Products:
 - 1. Intent: Unless specified elsewhere, provide hot dipped galvanized ferrous products wherever any one of the following conditions exist.
 - a. Where product is exposed on an "exterior surface".
 - b. Where product is exposed or in contact with moisture retaining or transmitting substrates, e.g., exterior facing (includes interior face of) concrete and masonry structures, slabs on grade, roof insulation, roof concrete deck fill, etc.
 - c. Where product is within and located anywhere within same enclosure or room where water is contained, where high humidity is present, or where enclosure will be subjected to water spray. These enclosures include, but are not necessarily limited to, the restrooms. Include products within cavities above "lay-in acoustical suspended ceilings".

February 27, 2026

2. Galvanizing: Provide hot dipped galvanized coatings complying with ASTM A 123, ASTM A 153, or ASTM A 153 as applicable to the product, or as otherwise acceptable to the Architect.

PART 3 - EXECUTION

3.01 DELIVERY, STORAGE, & HANDLING

- A. General: Comply with each Product Manufacturer's Project specific requirements.
- B. Delivery: Deliver products in original containers with seals unbroken and labels intact. Inspect products for damage upon arrival at site. Reseal and mark to indicate inspected material. Replace damaged materials in timely manner as not to jeopardize the Project schedule.
- C. Storage and Handling: Store and handle materials to prevent damage and deterioration. Secure from unauthorized access.
- D. Loading of Structure: Do not load any structure in any manner that can endanger the structure.

3.02 EXAMINATION

- A. Verification of Conditions: Prior to installation, verify the actual existing Project conditions under which the Work will be installed. Inform the Architect in writing of any detrimental conditions. Do not begin the Work where the detrimental conditions have not been brought into satisfactory conformance. Start of the Work indicates that the existing conditions are acceptable to ensure a successful installation.

3.03 INSTALLATION

- A. Installation, General: Comply with the Manufacturer's Project specific requirements. Do not provide any installations that would produce a quality less than indicated by the Contract requirements without acceptance by the Architect.
- B. Completeness of Assemblies: Refer to Division I - Summary of Work.
- C. Structural Stability and Compatibility of Assemblies: Each Installer and the Contractor shall review their work for structural stability and compatibility relative to the work of other Installers. Notify Architect of any concerns in writing.
- D. Tolerances: Install Work plumb, level, and true to line; without warp or wrack. Installed Work to conform to Industry acceptable tolerances for quality of Work required, except as otherwise indicated.
- E. Color, Pattern, Texture Variation:
 1. General: For each product, where any one of the following characteristics of color, pattern, and texture can vary for similar natural products or similarly finished products, install materials in each area to assure a uniform visual appearance acceptable to the Architect.
 2. Examples: Such products include, but are not limited to, certain stone

February 27, 2026

materials, tile, concrete, masonry, carpet, and wall covering.

3. Methods to Ensure Uniformity: Methods of ensuring uniformity may include utilizing materials in sequence as manufactured from same lots where singular lot may be used for single contiguous area or may require the hand selection of materials between several lots.
 4. Directional Pattern: When not otherwise indicated, for materials with specific directional pattern/texture, orient such pattern/texture as directed by Architect.
- F. Protection: It is the intent of the Contract Documents that the Work be clean, without contamination, without abnormal deterioration, without damage, and properly functioning at the time of acceptance by the Owner. Generally, conduct operations in strict conformance with each Manufacturer's recommendations and instructions applicable to the Project specific conditions and as otherwise necessary to accomplish the proper protection of the Work from all harmful causes.
- G. Defective Work: Replace defective work. Restoration may be accomplished when satisfactory to the Architect. Such work shall be done at no cost to the Owner.

END OF SECTION

SECTION 01630 – PRODUCT OPTIONS AND SUBSTITUTIONS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Requirements for substitution proposals.
 - 2. Requirements for “value engineering” proposals.
- B. Related Sections:
 - 1. Division 1 Sections, general.
 - 2. Section 01600 – MATERIALS AND EQUIPMENT.

1.02 DEFINITIONS

- A. Substitution Proposal: A proposal offered by the Contractor of a product(s) to be used in lieu of the specified product(s); which is generically similar to the specified product(s). Value Engineering proposals shall not be considered as part of the substitution review process, it is a separate process lead by the Owner and where appropriate the Architect and its designers may be asked to provide an opinion.
- B. Products: Use of words such as “products”, “materials”, “assemblies” “systems”, are to be used interchangeably and unless the proposal is specifically for only a single most basic (cannot be broken down any further) material unit or material component, the proposal shall mean and be measured in terms of all the - materials required for each use in the Project as a final in place assembly or system.
- C. Material Composition: Where word “material composition” is used, this word is to mean the actual scientific makeup of the product with percentage of each material or chemicals going in to make up the final product being evaluated. Material Safety Data Sheets are to be provided when available. Words such as “100% acrylic” or “100% urethane” or other words to that effect are not acceptable when the product is not in fact only made up of that material alone.
- D. Limitations: Where word “limitations” is used in conjunction with products being evaluated in proposals by the Architect, this word is to mean “anything” which could reduce or be less than any quality or any characteristic of the product as required for use in the Project at “any time” during its life expectancy, including its “life expectancy”; when compared to the specified product, when compared with other competitive generic products of the same type, and when compared with other competitive products that basically are designed for the same functional purpose. Examples include, but are not limited to, following.
 - 1. Incompatibility with Other Materials: Where any contacting material is deleterious to the other, e.g. electrolysis, corrosion, contamination, chemical sensitivity, bacteria or plant growth (mildew or algae growth, etc.), or any other deleterious material effects.
 - 2. Life Expectancy: Shorter life expectancy than specified materials.

February 27, 2026

3. Weatherability: Not as weatherproof as specified product, e.g., water leakage, air leakage, ultra-violet exposure, breath ability, and hydrostatic pressure effects.
4. Structural: Strength of product compared with specified material, e.g. compressive, tensile, and durometer hardness characteristics.
5. Durability: Resilience of product compared with specified material. Its ability to withstand physical abuse and movement, e.g. impact resistance, abrasion resistance, puncture resistance, and elongation.
6. Fire Resistance: Ability to resist various fire exposures.
7. Product Characteristics: Susceptibility to defects occurring due to the characteristics unique to the product, e.g., sensitivities such as those due to material composition (shelf life, curing methods, etc.), configuration, weight, size, substrate conditions, weather conditions, assembly conditions, applications methods, etc.
8. Other Characteristics: e.g., slip resistance, acoustic properties, and resistance to catastrophic events, etc.

1.03 SUBMITTALS

- A. Substitution: Submit complete, readable, and organized information, with all proposal data applicable to Project highlight marked. Information to include, but not necessarily be limited to, following.

1. Product Data:

- a. Published Data: Submit Primary Product Manufacturer's complete available published product data including, but not limited to, primary product descriptions, related product descriptions, color/pattern/texture charts, specifications, drawings, laboratory tested data, fabrication/installation instructions, and list of comparable Projects in Hawaii and other similar salt air/humid environments, such as Florida or any of the Southern States bordering the Gulf of Mexico.
- b. Comparison products:
 - i. Requirement: Submit a detailed comparison of the significant generic qualities of the proposed substitution with those of the work originally specified.
 - ii. Characteristics: List significant qualities including, but not necessarily limited to, following.
 - a). Material composition.
 - b). Sizes.
 - c). Weight/density.
 - d). Color, textures, patterns available.
 - e). Qualities critical to performances, including tests performed.
 - f). Limitations of product.
 - g). How long used in Hawaii?
 - h). How long available in U.S.?

- i). Current market share in Hawaii based upon specific material?
 - j). Current market share in U.S based upon specific material?
 - k). Current market share in Hawaii based upon all competitive materials serving same function?
 - l). Current market share in U.S based upon all competitive materials serving same function?
 - iii. Format: Submit in a typewritten table format in which characteristics are compared side by side.
2. Samples: Submit samples. Provide additional samples or small-scale mockups, if requested, by Architect. Samples to be submitted in accordance with Section 01330 – SUBMITTAL PROCEDURES requirements.
 3. Project Modifications: Where standard published drawings are not adequate, submit other drawings or legible to scale sketches to show each of following where applicable to Project.
 - a. Where Project dimensions would be affected, indicate with some typical examples how product affects Project dimensions.
 - b. Show custom modifications of product which are required for Project.
 - c. Show additional work required of other Installers which is not otherwise shown.
 - d. If any, penetrations are required through work, show how penetrations through work is to be accomplished, including any multiple penetrations.
 4. Changes to Other Work: Submit a list of written changes to the work of other Installers that would be necessary to accommodate the proposal.
 5. Cost Proposal:
 - a. During Bidding Period: Do not provide.
 - b. Post Bidding Period: Submit. Indicate the overall net change, if any, in the Contract Sum. Separately list cost of proposed Work, cost of changes to other Work, Contractor's cost, cost for Architect's time (verified from Architect) and other miscellaneous costs.
 6. Certifications: Sign certifications indicated on form.
 7. Substitution Proposal Form: In addition to other required data and samples, submit completed proposal form as provided by the Architect.

1.04 QUALITY ASSURANCE

- A. Objective: It is up to those making the pro prove to the Architect that the proposed products will meet the Project requirements. To the extent that the Proposer wishes to pursue the Work, the Architect reserves the right to request any information and samples necessary for him to make a decision.
- B. Quality of the Proposals: It is intended that the physical appearance and dimensions of the Project and the quality of the specified products required by the Contract Documents be maintained, unless otherwise specifically requested

February 27, 2026

by and acceptable to Architect or Owner. Generally, submit proposals that would result in installations of equivalent quality to that specified.

- C. Conditions for Consideration of a Proposal: The Contractor's proposals will be received and considered when extensive revisions to the Contract Documents are not required, when the proposed changes are in keeping with the primary intent of the Contract Documents, when the requests are timely, fully documented and properly submitted, and when one or more of the following conditions are satisfied.

1. Where the proposal is directly related to an "or equal" or "comparable product" clause or similar language in the Contract Documents.
2. Where the specified product or method cannot be provided within the Contract Time. Do not submit proposals which have resulted from the Contractor's failure to pursue the work promptly or to coordinate the various activities properly.
3. Where the specified requirements cannot receive necessary approval by a governing Authority, and the requested proposal can be approved.
4. Where a substantial advantage is offered the Owner, in terms of cost, time, energy conservation, or other considerations of merit, after deducting offsetting responsibilities the Owner may be required to bear. These additional responsibilities may include such considerations as additional compensation to the Architect for redesign and evaluation services, the increased cost of other work by the Owner or separate contractors, and similar considerations.
5. When the specified products or methods cannot be provided in a manner which is compatible with other materials of the work, and where the Contractor certifies that the substitution will overcome the incompatibility.
6. When the specified products or methods cannot be properly coordinated with other materials in the work, and where the Contractor certifies that the proposed substitution can be properly coordinated.
7. When the specified products or methods cannot receive a warranty as required by the Contract Documents and where the Contractor certifies that the proposed substitution can be given the required warranty.

- D. Factors Affecting Acceptance of Proposals:

1. Review Intent: It is intended to give all responsible proposals a fair review, however, the Architect and Owner reserves the right to deny acceptance of any proposal for any reason. Irresponsible use of proposal process may result in termination of the review process in its entirety by Architect and Owner.
2. Basis of Design:
 - a. Requirement: Where favorable consideration is given any proposed product which is different (not comparable as determined by Architect) than the specified product (basis of design); Contractor is required to secure a bid from the same Manufacturer of product in which design is based for a product it feels is comparable to the new proposed product under consideration; unless such product does not exist.

February 27, 2026

- b. Submittal: Submit written confirmation from Manufacturer of product for which design is based; either indicating that he has no comparable product or that it has provided a new Bid that is comparable to product under consideration. Submit confirmation and product literature of recommended product along with submittals required for proposed product.
3. During Bidding Period: Time period allotted to Architect for review of submittals is short. It is critical full documentation be received and that documentation complies strictly with requirements specified in "Documentation" paragraphs herein.
4. Post Proposal Period: No proposals will be considered, unless Owner specifically directs Architect to review Project for possible cost reductions through value engineering. Where value engineering is considered, then only the product(s) for which the Contractor is directed to look at by the Architect shall be considered by the Architect.
5. Documentation:
 - a. Intent, Information Access: Competitors should be fully aware of the advantages and disadvantages of their products and of their competitor's products. Should any knowledge be lacking, each competitor should be fully capable of accessing and securing accurate information. Where this is not possible, and unless the product is proprietary, these competitors should not offer proposals for this Project.
 - b. Quality of Information in Proposal: The Architect should be able to fully and accurately evaluate the difference between the specified product(s) and the proposed product(s) from each proposal. Do not to submit proposals with least amount of information possible without his prior knowledge, as there is no reason for the Architect to reconsider any proposal that has been "not accepted" for any reason, including one that is not adequately documented in the Architect's opinion.
 - c. Reduction of Information Provided: When acceptable to the Architect, the extent of the submittals may be reduced when approved by Architect prior to the submission of each proposal. Generally, these will be for obvious products which are and fall into generic categories very familiar to the Architect. Where the Architect agrees to reduce the amount of information to be provided, the Architect reserves the right to expand the requirement again where the Architect feels that the proposal "objective" was not achieved.
 - d. Comparison of Products: In addition to the other required submittals, the "Comparison of Products" table is a key submittal to the whole proposal and is a requisite to acceptance. This submittal is not to be deleted.
- E. As Part of Work-Related Submittals: Submission of unspecified products or methods as part of "work-related" submittals, does not constitute an acceptable or valid method for processing substitution proposals. Successfully reviewed "work related" submittals does not indicate approval of unspecified products or methods.

February 27, 2026

- F. Architect's Requirements: Verify prior to submission of any proposal, the Architect's requirements necessary to fully conform proposal to Contract requirements. Request for additional costs after acceptance of any proposals will be denied.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 PROPOSAL PROCESS

- A. Proposals Offered During Bidding Period:
1. Submission: In accordance with the "Instructions to Bidders" and its supplements.
 2. Acceptable Proposals: Architect to send written notification to each eligible Bidder of acceptance of the proposal with copies of the accepted proposal. Eligible Bidders may incorporate the substitutions in accordance with the accepted proposal.
 3. Proposals Not Accepted: Architect to send each proposal that are not accepted back to the Bidder who originated the proposal. Architect to have mark the proposal "Not Accepted". Bidder may resubmit proposal, where specified time period allowed for review of proposals is not exceeded and where resubmission is acceptable to Architect. Refer to Architect's "Comments" for additional requirements suggested for compliance, if any.
- B. Post Bidding Period Proposals:
1. Submission: As directed by Architect.
 2. Acceptable Proposals:
 - a. Preliminary Acceptance: Where marked "Acceptable, Preliminary" on form, indicates that further information may be required before a decision is made. Comply with "Comments" on form and where not indicated verify additional requirements from Architect, and resubmit a complete proposal conforming to new requirements. Adjust costs if required. Use of proposed products are not allowed, until "Acceptable, Final" is marked on the proposal.
 - b. Final Acceptance: Where marked "Acceptable, Final" on form, proposals and any other attachments to become basis of Contract.
 3. Proposals Not Accepted: Where marked "Not Accepted", resubmission may be allowed when Architect indicates "Resubmission Acceptable" and resubmission will be denied when Architect indicates "Resubmission Denied" on form. Where remarks are indicated under "Comments", comply with any further requests which may be indicated.

3.02 INCORPORATION

- A. Incorporation of Proposals: Coordinate work with other affected Installers of other Work. Comply in strict accordance with accepted proposal that should be in strict conformance Product Manufacturer's Project specific requirements.

END OF SECTION

SECTION 01720 – PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Contract Closeout Record Documents.
 - 2. Construction Photographs
- B. Related Sections:
 - 1. Division I Sections, General.
 - 2. Section 01700 – PROJECT CLOSEOUT
 - 3. Division 15 Sections.
 - 4. Division 16 Sections.
 - 5. Other Sections requiring Project Record Documents.

1.02 DEFINITION

- A. Contract Closeout Record Documents: Contractor produced documents representing an accurate record of Work provided under Contract. Documents include updated Contract Documents with support data and Operation & Maintenance Manuals.

1.03 SUBMITTALS

- A. Contract Closeout Record Documents:
 - 1. Contract Documents: Submit three (3) sets and PDF electronic files of each of following, except as otherwise indicated.
 - a. Updated Contract Drawings.
 - b. Updated Project Manual.
 - c. Other drawn and written support data for Drawings and Project Manual necessary to show record of Work.
 - 2. Operating/Maintenance Manuals: Submit three (3) sets and PDF electronic files.
 - 3. Certification: On transmittal or separate written document, certify that information provided is complete and accurate. Signature document by Contractor.
 - 4. Distribution: Architect, Owner's Representative, Owner, and Operator.
- B. Quality Assurance Submittals: Submit in accordance with "Quality Assurance" paragraphs herein.

1.04 QUALITY ASSURANCE

- A. Contract Closeout Record Documents:

February 27, 2026

1. Up-to-Date Records: Maintain up-to-date documents during Contract Period. Record data not less than ten (10) working days after installation of each specific portion of Work requiring recording, except record data prior to any concealment of the Work.
2. Availability: Documents are to be made available to Architect at any time for his review. Timely recording of information and accuracy of recorded information is responsibility of Contractor; whether or not reviewed by Architect.
3. Out-of-Date Records: If in opinion of Architect, records are not being timely recorded by Contractor, Owner reserves the right to hire a professional third party service in which to input the required data. If such service is required, Contractor to cooperate with third party service as necessary for third party service to properly and in timely manner record required data. Contractor to pay for all costs associated with securing and maintaining such service for period such service is required.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 MAINTENANCE OF DOCUMENTS

- A. Storage: Store documents on or in equipment designed for filing and storage of such documents, including rack and filing cabinets. Locate Contract Documents used for Contract Closeout Record Documents in fire resistant cabinet.
- B. Handling: Maintain documents in clean, dry and undamaged condition. Use documents only as necessary to record required information. Do not use as construction set.

3.02 CONTRACT CLOSEOUT RECORD DOCUMENTS – DRAWINGS AND SPECIFICATIONS

- A. Time of Submission: Refer to Division 1 Contract Closeout.
- B. Intent: Update information shown on Contract Drawings and in Project specifications which differ from what was originally drawn or specified. Record drawn information accurately to scale. Written data to be legibly printed.
- C. Contract Drawings and Project Specifications: Keep record documents current. Legibly mark with erasable red pencils or other contrasting colored pencils when more than one color may more clearly delineate the recorded information. Where recorded to Contract Drawings, record information to same scale as drawing. Colored pencil marks to be visible on background of sheet to which marks are applied.
 1. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Depths of foundations below first floor.

- d. Locations and depths of underground utilities.
 - e. Revisions to routing of piping and conduits.
 - f. Revisions to electrical circuitry.
 - g. Actual equipment locations.
 - h. Duct size and routing.
 - i. Locations of concealed internal utilities
 - j. Changes made by Change Order or Construction Change Directive.
 - k. Changes made following Architect's written orders.
 - l. Details not on the original Contract Drawings.
 - m. Field records for variable and concealed conditions.
 - n. Record information on the Work that is shown only schematically
2. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- D. Supporting Data: Other documents may be used in lieu of Contract Documents, when complying with following.
- 1. Conditions for Acceptance:
 - a. Documents capable of more clearly showing actual installations provided.
 - b. When documents are required as drawings, drawn elements are to be in an Architect acceptable architectural scale.
 - c. Each document is referenced to Contract Documents in logical manner that documents used can be readily identified with the affected Contract Document work.
 - d. Submittal format is complied with.
 - 2. Types of Base Documents available for Use:
 - a. Product Data: May be used in place of Contract Drawings or Specifications.
 - b. Shop Drawings: May be used in place of Contract Drawings.
 - c. Other Documents: Any other documents officially used for Project and previously reviewed by Architect in submittals may be used when acceptable to Architect.
 - 3. Submittal Format:
 - a. Intent: Sequentially organize data as referenced in Contract Documents. Data may be provided in either bound or filed format as specified in paragraphs below. Each data to be indexed and clearly identified with typewritten labels.
 - b. Bound Data: Provide in format similar to that required for Operations & Maintenance Manuals; except each drawing is to be neatly folded in 8-1/2" x 11" format and inserted into pocket type jackets manufactured for binder insertion.

- c. Filed Data: Provide filed data in “Bankers Box” as manufactured by Fellowes or comparable heavy-duty card board box acceptable to Architect. Each data to be filed into logical groupings in file folders and clearly identified. Drawings are to be neatly folded to fit file folder format.
 - d. Marking Data: Mark Project applicable data. Utilize permanent contrasting markers. Written data to be highlight marked with transparent markers. Drawn data to be with opaque markers. Do not obscure other information.
- E. “Record Documents” Labeling:
- 1. General: Stamp each page in permanent ink, words “RECORD DOCUMENTS”, in bold capital letters, on bottom outside corner; unless otherwise acceptable to Architect. Do not obscure any existing information. Each page means both sides of sheet where printed matter occurs on both sides.
 - 2. Drawings: Letters of stamp to be 3/4” height minimum.
 - 3. Project Manual: Letters of stamp to be 1/4” height minimum.
 - 4. Support Data: Letters of stamp to be 1/4” height minimum. Single stamped label may be applied when data is on single folded page or in permanently bound format such as spiral bound or paper back book type binding.

3.03 CONTRACT CLOSEOUT RECORD DOCUMENTS -
OPERATING/MAINTENANCE MANUALS

- A. Format:
- 1. Binders: Assemble data in hard covered, slant ring binders with 3 rings and non-glare, see through pockets on front of each cover and on spine. Insert in spine pocket and front cover pocket project name, Owner’s project identification number, summary of typical contents, and volume identification in a “volume of volumes” format.
 - 2. Indexed Data: Index data. Provide identification on each index.
 - 3. Data Format:
 - a. Table of Contents.
 - b. General Data.
 - i. Primary Contractor/Subcontractor List.
 - ii. Record Documents List.
 - iii. Contractor’s Project Guarantee.
 - iv. Permits.
 - c. Group (Specification Section) Data.
 - i. Contractor/Subcontractor List.
 - ii. Operation, Service, Maintenance Data.
 - iii. Guarantees/Warrantees.

iv. Permits/Certificates.

B. Table of Contents:

1. Index Related: Provide copies in each volume and at front of each volume. Indicate summary of contents in each indexed grouping.
2. Group Related: For each group of indexed data, in front of group data, include table of contents specific to group.

C. General Data:

1. Primary Contractor/Subcontractor List: Submit complete listing of all primary Subcontractors and Suppliers involved with Work, including with General Contractor at top of list. Organize list in accordance with Table of Contents CSI Specification Numbers and Names. Relate each Subcontractor and Supplier to Specification Section under which work was provided. Provide each entity's company name, address, phone number, CEO, and primary person or persons involved with Project.
2. Contractor's Project Guarantee: For Owner's copy submit insert original signed guarantee. For other required submittal sets include copies of signed guarantee.
3. Records Documents List: Complete typed listing of Drawings and Specifications Sections used as final Record Documents for Project.
4. Permits: Copies of all final signed permits required for Work.

D. Group Data: Create a group of related data for each specific system, product, or equipment required for Record Documents. Organize each group sequentially by Specification Number. Each page of each data in group to be identified with hand written or typewritten number identifying them with "group" Specification Number. Permanently bound data may have single identification on front of page. Stapled, clipped, or similarly fixed data are not considered as "permanently bound" and are to have required identification on each page. Accurately provide three hole punched or drilled holes necessary for insertion into binders. For each group, provide following information.

1. Contractor/Subcontractor List: Submit complete listing with Company name, address, phone number, CEO, and primary person or persons involved with Project. Repeat data even if listed under "General Data, Primary Contractor/Subcontractor List".
2. Reviewed Submittals: For each group, submit Product Data and other written submittal data successfully reviewed by Architect during Contract Period.
3. Guarantees/Warrantees: For each group, submit following.
 - a. Standard Manufacturer's Warrantees: Include when normally provided with product; whether specified or not.
 - b. Special Warrantees: Include when specified for products.
4. Operation, Service, Maintenance Data: When specified, submit required data. Where parts listings are available from Manufacturer of product, submit written data of parts listings and service company listings.

END OF SECTION

SECTION 01770 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Repair of the Work.
- B. Related Sections:
 - 1. Section 01330 – SUBMITTAL PROCEDURES.
 - 2. Section 01595 - PROJECT CLEANING.
 - 3. Section 01720 - PROJECT RECORD DOCUMENTS

1.02 SUBMITTALS

- A. Product Data: For cleaning agents.
- B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at Final Completion.
- D. Certificates of Release: From authorities having jurisdiction.
- E. Certificate of Insurance: For continuing coverage.

1.03 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.04 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items (Contractors Punch List): Prepare and submit a list of items to be completed and corrected at the time of each inspection, indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 calendar days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 - 1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final

February 27, 2026

completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.

3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Owner's Representative. Label with manufacturer's name and model number where applicable.
 - a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Architect's signature for receipt of submittals.
 5. Submit test/adjust/balance records.
 6. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 calendar days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Advise Owner of pending insurance changeover requirements.
 2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
 3. Complete startup and testing of systems and equipment.
 4. Perform preventive maintenance on equipment used prior to Substantial Completion.
 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
 6. Advise Owner of changeover in HVAC and other utilities.
 7. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 8. Complete final cleaning requirements, including touchup painting.
 9. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect and Owner's Representative will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

February 27, 2026

2. Results of completed inspection will form the basis of requirements for final completion.

1.05 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:
 1. Submit a final Application for Payment according to Section 01290 - PAYMENT PROCEDURES.
 2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect and Owner's Representative will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
 1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.06 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction. Use Contractors form and format acceptable to the Architect
 1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
 3. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Architect and Owner's Representative.
 - d. Name of Contractor.
 - e. Page number.
 4. Submit list of incomplete items in the following format:

- a. PDF electronic file. Architect will return annotated file.

1.07 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
 1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
 4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
- C. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
 1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
 2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that already show evidence of repair or restoration.

February 27, 2026

- a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION

DIVISION 2 – SITE CONSTRUCTION

SECTION 02070 – SELECTIVE DEMOLITION

PART 1 - GENERAL

1.01 SUMMARY

A. Work Includes:

1. Demolition of portions of concrete slabs and pavements.

B. Related Work Described Elsewhere

1. Section 01100 – PROJECT REQUIREMENTS
2. Section 01500 – TEMPORARY FACILITIES AND CONTROLS
3. Section 01010 – SUMMARY OF WORK
4. Section 01595 – PROJECT CLEANING
5. Section 02100 – SITE PREPARATION
6. Section 02110 – REMOVAL OF STRUCTURES AND OBSTRUCTIONS
7. Architectural Drawings and Specifications

C. The extent of selective demolition work is indicated on the Drawings.

D. It shall be the responsibility of the Contractor to examine the project site and determine the existing conditions for themselves.

E. Selective demolition work includes but is not limited to removal and subsequent disposal of all non-hazardous materials indicated or required to be removed.

F. Execute all work in an orderly and careful manner with due consideration for all items or work to remain.

G. Clearly obvious conditions requiring selective demolition, which exist at the site, shall be accepted as part of the work, even though they may not be clearly indicated on the Drawings and/or described herein, or may vary therefrom.

H. All debris of any kind accumulated from the work of this Section shall be disposed of off the site, unless noted otherwise.

I. Permits , Notice, Etc.:

1. The Contractor shall procure and pay for all necessary permits or certificates the may be required in connection of this work.

February 27, 2026

2. The Contractor shall serve proper notice and consult with Owner's Representative regarding any temporary barricades that are required, or for disconnections of electrical or other utility lines in the area which may interfere with the removal work. All such lines, where necessary, shall be properly disconnected or relocated prior to commencing with demolition work.

1.02 SUBMITTALS

- A. Meet requirements of Section 01330 – SUBMITTAL PROCEDURES
- B. Proposed Protection Measures: Submit informational report, including drawings, that indicates the measures proposed for protecting individuals and property, for dust control and for noise control. Indicate proposed locations and construction of barriers.
 1. Adjacent Portions of Building: Portions of the site, including structures, adjacent to the areas to be demolished are to be kept intact. The demolition to take place in these areas is to be performed with the utmost care to avoid damage to the adjacent structures. Submit detailed special measures proposed to protect adjacent structures to remain.
- C. Schedule of Demolition Activities: Indicate the following:
 1. Detailed sequence of demolition work, with starting and ending dates for each activity.
- D. Demolition Plans: Drawings indicating the following:
 1. General site and other features to be removed and disposed of.
 2. Locations of temporary protection and means of egress for adjacent occupied areas of the building.
- E. Pre-demolition Photographs: Show existing conditions of adjoining construction, including finish surfaces that might be misconstrued as damage caused by demolition operations. Submit before the Work begins.

1.03 QUALITY ASSURANCE

- A. Use adequate numbers of skilled mechanics who are thoroughly trained and experienced in the necessary crafts.
- B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Pre-demolition Conference: Conduct conference at Project site to review methods and procedures related to building demolition including, but not limited to, the following:
 1. Inspect and discuss condition of construction to be demolished.

February 27, 2026

2. Review and finalize demolition schedule and verify availability of demolition personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review and finalize protection requirements.
4. Review procedures for noise control, and dust control.
5. Review procedures for protection of adjacent, occupied structures or buildings.
6. Review schedule of work hours and facility rules.

1.04 PROJECT CONDITIONS

- A. Existing conditions: The owner assumes no responsibility for actual condition of items to be demolished.
- B. Conditions existing at time of commencement of contract will be maintained by the owner insofar as practical.
- C. Occupancy: Building areas subject to demolition will be vacated and discontinued in use by the owner prior to start of work.
- D. Do not interfere with use of adjacent building areas. Maintain free and safe passage to and from occupied spaces.
- E. Provide accessibility around temporary structures conforming to ADAAG Section 4.1.1(4).
- F. Prevent movement or settlement of structure. Provide and place bracing or shoring and be responsible for safety and support of structure. Assume liability for such movement, settlement, damage, or injury. Cease operations and notify the Owner's Representative immediately, if safety of structure appears to be endangered. Take precautions to properly support structure. Do not resume operations until safety is restored.
- G. Traffic: Conduct selective demolition operations and debris removal in a manner to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. Do not close, block or otherwise obstruct streets, walks or other occupied or used facilities without written permission from the Owner's Representative. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations, as directed by the Owner's Representative.
- H. Dust Control:
 1. Keep dust within acceptable levels at all times, including non-working hours, weekends and holidays as specified in Section 01500 – TEMPORARY FACILITIES AND CONTROLS.

February 27, 2026

2. Mechanical dry sweeping is not permitted. Vacuuming, wet mopping, approved limited dry hand, wet or damp sweeping is acceptable.
 3. During loading operations, water down debris and waste materials to allay dust.
 4. The method of dust control and all costs incurred thereof shall be the responsibility of the Contractor.
- I. Noise Control: As specified in Section 01500 – TEMPORARY FACILITIES AND CONTROLS.
 - J. Fire Safety: Fire safety during demolition shall comply with the 2006 Uniform Fire Code, as amended.

1.05 EXISTING UTILITY SERVICES

- A. Do not abandon or otherwise alter utility services or drainage lines which would impair service to existing building areas.
- B. Maintain utilities in service, protect, and reconstruct if damaged, all in-service utility pipes or conduits, except services to the structures to be dismantled. Reconstruct in-service utility pipes or conduits if damaged at no additional cost to the owner.
- C. If service must be interrupted, observe requirements of Section 01700 – EXECUTION REQUIREMENTS.
- D. Report damage, however slight, immediately. Do not repair or reconstruct any utility pipe, conduit or installation without authorization; however, except perform emergency repairs immediately.

1.06 HAZARDOUS MATERIALS

- A. In the event that asbestos, urea formaldehyde or other toxic substances are present in the existing structures, observe the applicable requirements of Hawaii Occupational Safety and Health Standards.

1.07 COORDINATION

- A. Arrange demolition schedule so as not to interfere with the owner's on-site operations and operations of adjacent occupied buildings and areas.
 1. At the end of each work period areas are required to be cleaned and readied for occupants. The condition of the areas shall be such that there is no interference with the typical work activities perform by the occupants and that the occupants safety is not compromised

PART 2 - PRODUCTS

2.01 SALVAGE MATERIALS

HAWAII HEALTH SYSTEMS CORPORATION – KAUAI DIVISION
Samuel Mahelona Memorial Hospital
Emergency Department
Project No. 225057-01

Selective Demolition
02070-4

February 27, 2026

- A. Salvaged materials not indicated for reuse or salvage for the owner shall become Contractor's property. Remove from site and dispose of at Contractor's option.
- B. Items of salvageable value not indicated for reuse may be removed from structure as work progresses. Salvaged items must be transported from site as they are removed. Storage or sale of removed items on site will not be permitted.
- C. Historic items, antiques, and similar objects including, but not limited to, commemorative plaques and tablets, and other items of interest or value to the owner that may be uncovered during demolition remain the property of the owner.
 - 1. Carefully salvage in a manner to prevent damage and promptly return to the Owner.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine the conditions under which work of this section will be performed. Do not proceed until unsatisfactory conditions detrimental to timely and proper completion of the work have been corrected.
- B. Verify that utilities have been disconnected and capped before starting demolition operations.
- C. Inventory and record the condition of items to be removed and salvaged. Photograph existing conditions of structure surfaces, equipment or to surrounding properties which could be misconstrued as damage resulting from selective demolition work. File with Owner's Representative prior to starting work.
- D. Engage a professional engineer currently licensed in the owner to perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during building demolition operations.
- E. If hazardous materials were found to exist, verify that hazardous materials have been remediated before proceeding with building demolition operations.

3.02 PREPARATION

- A. Maintain exit requirements throughout construction period.
- B. Erect and maintain temporary barricades complying with the requirements of Section 01100 – PROJECT REQUIREMENTS. On completion, remove barricades and repair damaged surfaces to match adjacent surfaces.
- C. Existing Utilities: Locate, identify, disconnect, and remove indicated utilities serving portions of the building to be demolished.

1. If removal, relocation, or abandonment of utility services will affect adjacent occupied areas and buildings, then provide temporary utilities that bypass the portions of the building to be demolished and that maintain continuity of service to other buildings and adjacent areas.
 2. Cut off pipe or conduit and cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing according to requirements of authorities having jurisdiction.
- D. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.
1. Strengthen or add new supports when required during progress of demolition.

3.03 DEMOLITION

- A. Demolition Work: Conform to owner of Hawaii, Occupational Safety and Health Standards; Subtitle 8, Division of Occupational Safety and Health; Part 3, Construction Standards; Chapter 131.1, Demolition.
- B. Pollution controls: Provide temporary enclosures and use suitable methods to limit dust and dirt to the lowest practical level. Comply with governing regulations pertaining to environmental protection. Observe dust control measures of Section 01500 – TEMPORARY FACILITIES AND CONTROLS.
- C. Explosives: Use of explosives will not be permitted.
- D. Selective Demolition
1. Extent of demolition and removal as shown are minimum requirements. Contractor shall be responsible for the extent of work required to properly accommodate the methods of construction required for the new work. Additional work required to accommodate construction shall be considered incidental to the new work and shall be done at no additional cost to the owner. Contractor and its demolition subcontractor, as part of the bid proposal to review the demolition scope along with the new work and conduct site visit(s) to understand the extent of the scope and provide as part of its bid proposal, to include all work to accomplish the final work.
 2. Conduct demolition of designated items and components as indicated on the Drawings and site investigation(s) in an orderly and careful manner as required to accommodate new work, including that required for connection to the existing building. Protect existing supporting structural members.
 3. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.

February 27, 2026

4. Use the utmost care to avoid damage to the items being removed and designated for reuse including but not limited to:
5. Use methods required to complete the Work within limitations of governing regulations.
6. Locate demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
7. Cease operations and notify Architect and Owner's Representative immediately if safety of adjacent structure appears to be endangered. Do not resume operations until safety is restored.
8. Remove contaminated, vermin infested, or dangerous materials encountered and dispose of by safe means.
9. Do not demolish, chip or penetrate any portion of existing structural members not designated for such without the expressed approval of the Architect and Engineer.
10. Repair excess demolition to match adjacent surfaces.

3.04 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove debris, rubbish, and other materials resulting from demolition operations from the site. Transport materials removed from demolished structures and legally dispose of off site.
- B. Do not allow demolished materials to accumulate on-site.
- C. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- D. Burning of removed materials from demolished structures will not be permitted on site.

3.05 CLEANUP AND REPAIR

- A. Repair damage to adjacent structure and improvements resulting from this work at no cost to the owner.
- B. Clean adjacent areas, structures and improvements of dust, dirt, and debris caused by demolition operations, as directed by Owner's Representative or governing authorities. Return adjacent areas to condition existing prior to start of work.

END OF SECTION

DIVISION 2 – SITE CONSTRUCTION

SECTION 02100 – SITE PREPARATION

PART 1 -GENERAL

1.01 DESCRIPTION

- A. The work to be performed under this section shall include clearing the premises of all obstacles and obstructions, the removal of which will be necessary for the proper reception, construction, execution and completion of the other work included in this contract.

PART 2 -MATERIALS (NOT USED)

PART 3 -EXECUTION

3.01 GENERAL

- A. Maintenance of Traffic: The Contractor shall conduct operations with minimum interference to streets, driveways, sidewalks, passageways, etc. When necessary, the Contractor shall provide and erect barriers, etc., with special attention to protection of personnel.
- B. Protection: Throughout the progress of the work, protection shall be provided for all property and equipment, and temporary barricades shall be provided as necessary. Work shall be done in accordance with the safety provisions of the Manual of Accident Prevention in Construction, published by the Associated General Contractors of America, and the State of Hawaii's Occupational Safety and Health Standards, Rules and Regulations.
- C. Fires: No burning of fires of any kind will be allowed.
- D. Reference Points: Bench marks, etc., shall be carefully maintained, but if disturbed or destroyed, shall be replaced as directed, at the Contractor's expense.
- E. Disposal: All materials resultant from operations under these specifications, unless noted otherwise, shall become the property of the Contractor and shall be removed from the site. Loads of materials shall be trimmed to prevent droppings. No materials shall be dumped on private or public property without proper authority.

3.02 EXISTING UTILITY LINES

- A. The existence of active underground utility lines within the construction area is not definitely known other than those indicated in their approximate locations on the Drawings. Should any unknown line be encountered during excavation, the Contractor shall immediately notify the Owner's Representative of such

discovery. The Owner's Representative shall then investigate and issue instructions for the preservation or disposition of the unknown line. Authorization for extra work shall be issued by the Owner's Representative only as he deems necessary.

3.03 CLEARING AND GRUBBING

- A. The Contractor shall clear the premises of all obstacles and obstructions, the removal of which will be necessary for the proper reception, construction, execution and completion of work included in this contract. The area below the natural ground, within the limits of the grading work indicated on the grading plans shall be grubbed of all stumps, roots, buried logs, decayed vegetable matter, and other objectionable materials, as is necessary for the proper reception, construction, execution, and completion of work included in this contract.
- B. The Contractor shall protect from injury and damage all surrounding (including adjacent property lines of the project site) trees, plants, etc., and shall leave all in as good as condition as at present. Any damage to existing improvement shall be repaired or replaced by the Contractor to the satisfaction of the Owner's Representative.
- C. Debris from clearing and grubbing operations shall not be placed in streams, water courses or at locations that will impede flow of the natural drainage pattern.

3.04 TOPSOIL EXCAVATION

- A. Strip topsoil from areas that are to be filled, excavated, landscaped or re-graded to such a depth that it prevents intermingling with underlying subsoil or questionable material.
- B. Cut heavy growths of grass from areas before stripping and remove with the rest of the cleared vegetative material.
- C. Topsoil shall consist of organic surficial soil found in depth of not less than 6". Satisfactory topsoil is reasonably free of subsoil, clay lumps, stones and other objects over 2" in diameter, weeds, roots, and other objectionable material.
- D. Stockpile topsoil in storage piles in areas shown or where directed. Construct storage piles to freely drain surface water. Cover storage piles as required to prevent windblown dust. Dispose of unsuitable topsoil as specified for waste material, unless otherwise specified by owner. Excess topsoil shall be removed from the site by the Contractor unless specifically noted otherwise on the Drawings.

3.05 CLEANUP OF PREMISES

- A. Clean up and remove all debris accumulated from construction operations from time-to-time as directed. Upon completion of the construction work and before final acceptance of the contract work, remove all surplus materials, equipment, scaffoldings, etc., and leave entire job site raked clean and neat to the satisfaction of the Owner's Representative.

February 27, 2026

END OF SECTION

SECTION 02221 - BUILDING DEMOLITION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes the following:
 - 1. Demolition and removal of buildings.
 - 2. Removing below-grade construction.
 - 3. Disconnecting, capping or sealing, and removing site utilities.
 - 4. Vector Control
- B. Related Sections include the following:
 - 1. Section 01010 - SUMMARY for use of the premises and phasing requirements.
 - 2. Section 01500 - TEMPORARY FACILITIES AND CONTROLS for temporary construction, protection facilities, and environmental-protection measures for building demolition operations.
 - 3. Section 01210 - ALLOWANCES
 - 4. Section 01270 - VARIABLE QUANTITIES UNIT PRICES

1.03 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.
- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
 - 1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.04 SUBMITTALS

- A. Proposed Protection Measures: Submit informational report, including drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control for noise control and vector control. Indicate proposed locations and construction of barriers.
 - 1. Adjacent Buildings: Detail special measures proposed to protect adjacent buildings to remain.

- B. Schedule of Building Demolition Activities: Indicate the following:
 - 1. Vector Control
 - 2. Detailed sequence of demolition work, with starting and ending dates for each activity.
 - 3. Temporary interruption of utility services.
 - 4. Shutoff and capping of utility services.
- C. Building Demolition Plans: Drawings indicating the following:
 - 1. Locations of temporary protection and means of egress for adjacent occupied buildings.
- D. Predemolition Photographs: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by building demolition operations. Submit before the Work begins.
- E. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.
- F. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

1.05 QUALITY ASSURANCE

- A. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.
- B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Standards: Comply with ANSI A10.6 and NFPA 241.
- D. Predemolition Conference: Conduct conference at Project site to comply with requirements in Section 01311 - PROJECT COORDINATION. Review methods and procedures related to building demolition including, but not limited to, the following:
 - 1. Inspect and discuss condition of construction to be demolished.
 - 2. Review and finalize building demolition schedule and verify availability of demolition personnel, equipment, and facilities needed to make progress and avoid delays.
 - 3. Review and finalize protection requirements.
 - 4. Review procedures for vector control, noise control, and dust control.
 - 5. Review procedures for protection of adjacent buildings.
 - 6. Review items to be salvaged and returned to Owner.

1.06 PROJECT CONDITIONS

- A. Vector Control: Prior to Building Demolition, vector control procedures shall be performed in accordance to the State of Hawaii Department of Health's Administrative Rules Title 11 Chapter 26 "Vector Control" Article 11-26-35.
- B. Buildings to be demolished will be vacated and their use discontinued before start of the Work.
- C. Buildings immediately adjacent to demolition area will be occupied. Conduct building demolition so operations of occupied buildings will not be disrupted.
 - 1. Provide not less than 72 hours' notice of activities that will affect operations of adjacent occupied buildings.
 - 2. Maintain access to existing walkways, exits, and other facilities used by occupants of adjacent buildings.
 - a. Do not close or obstruct walkways, exits, or other facilities used by occupants of adjacent buildings without written permission from authorities having jurisdiction.
- D. Owner assumes no responsibility for buildings and structures to be demolished.
 - 1. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- E. Hazardous Materials: Hazardous materials are present in buildings and structures to be demolished. The owner has not conducted hazardous materials testing within the project area. Contractor acknowledges that concealed, encapsulated or otherwise unidentified hazardous materials may be encountered during demolition activities.

1.07 COORDINATION

- A. Arrange demolition schedule so as not to interfere with Owner's on-site operations and operations of adjacent occupied buildings.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting demolition operations.
- B. Inventory and record the condition of items to be removed and salvaged. Provide photographs of conditions that might be misconstrued as damage caused by salvage operations.
- C. Engage a professional engineer to perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during building demolition operations.

- D. Verify that hazardous materials have been remediated before proceeding with building demolition operations.

3.02 PREPARATION

- A. Perform Vector Control as stated in Article 1.06 "Project Conditions"
 - 1. Prior to demolition of buildings and clearing of site, hire a licensed pest control firm or assign a qualified employee to perform the following:
 - a. Ascertain the presence or absence of rodents which, when dispersed from premises, may endanger the public health.
 - b. Eradicate the rodents should inspection reveal their presence.
 - 2. If an anti-coagulant bait such as Warfarin, Pival, Fumarin or diphacinone is used, inspect bait daily. Replenish bait as required to provide a continuous supply for uninterrupted feeding by rodents for one week minimum prior to starting clearing and demolition work.
 - 3. Notify the Vector Control Branch of the State Health Department of the presence of on-site rodents which require eradication. Provide reports as the State Health Department may require.
- B. Refrigerant: Remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction before starting demolition.
- C. Existing Utilities: Locate, identify, disconnect, and remove indicated utilities serving buildings and structures to be demolished.
 - 1. Arrange to shut off indicated utilities with utility companies.
 - 2. If removal, relocation, or abandonment of utility services will affect adjacent occupied buildings, then provide temporary utilities that bypass buildings and structures to be demolished and that maintain continuity of service to other buildings and structures.
 - 3. Cut off pipe or conduit a minimum of 24 inches below grade. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing according to requirements of authorities having jurisdiction.
- D. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.
 - 1. Strengthen or add new supports when required during progress of demolition.

3.03 PROTECTION

- A. Existing Facilities: Protect adjacent walkways, loading docks, building entries, and other building facilities during demolition operations. Maintain exits from existing buildings.
- B. Existing Utilities: Maintain utility services to remain and protect from damage during demolition operations.

1. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction.
2. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and authorities having jurisdiction.
 - a. Provide at least 72 hours' notice to occupants of affected buildings if shutdown of service is required during changeover.

3.04 DEMOLITION, GENERAL

- A. General: Demolish indicated existing buildings, concrete pads and walkways completely. Use methods required to complete the Work within limitations of governing regulations and as follows:
 1. Do not use cutting torches until work area is cleared of flammable materials. Maintain portable fire-suppression devices during flame-cutting operations.
 2. Maintain fire watch during and for at least 2 hours after flame cutting operations.
 3. Maintain adequate ventilation when using cutting torches.
 4. Locate building demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
- B. Site Access and Temporary Controls: Conduct building demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
 2. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as flooding, and pollution.
- C. Explosives: Use of explosives is not permitted.

3.05 DEMOLITION BY MECHANICAL MEANS

- A. Proceed with demolition of structural framing members systematically, from higher to lower level. Complete building demolition operations above each floor or tier before disturbing supporting members on the next lower level.
- B. Remove debris from elevated portions of the building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
 1. Remove structural framing members and lower to ground by method suitable to minimize ground impact and dust generation.
- C. Below-Grade Construction: Demolish foundation walls and other below-grade construction.

February 27, 2026

1. Remove below-grade construction, including basements, foundation walls, and footings, completely
- D. Existing Utilities: Demolish and remove existing utilities and below-grade utility structures.

3.06 SITE RESTORATION

- A. Below-Grade Areas: Completely fill below-grade areas and voids resulting from building demolition operations with satisfactory soil materials according to backfill requirements in Section 02200 - EARTHWORK.
- B. Site Grading: Uniformly rough grade area of demolished construction to a smooth surface, free from irregular surface changes. Provide a smooth transition between adjacent existing grades and new grades.

3.07 REPAIRS

- A. Promptly repair damage to adjacent buildings caused by demolition operations.

3.08 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove debris, rubbish, and other materials resulting from demolition operations from the site. Transport materials removed from demolished structures and legally dispose of off site.
- B. Do not allow demolished materials to accumulate on-site.
- C. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- D. Burning of removed materials from demolished structures will not be permitted on site.

3.09 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by building demolition operations. Return adjacent areas to condition existing before building demolition operations began.

END OF SECTION

February 27, 2026

SECTION 02282 - TERMITE CONTROL/VAPOR BARRIER

PART 1 – GENERAL

1.01 SUMMARY

- A. Products supplied under this section:
 - 1. Termite Control/Vapor barrier and accessories for installation under concrete slabs.
- B. Related sections:
 - 1. Section 02200 - EARTHWORK.
 - 2. Section 03300 - CAST-IN-PLACE CONCRETE.

1.02 REFERENCES

- A. ASTM International:
 - 1. ASTM E1745-17: Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.
 - 2. ASTM E1643-18a: Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.
- B. Technical Reference - American Concrete Institute (ACI):
 - 1. ACI 302.2R-06 Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.
 - 2. ACI 302.1R-15: Guide to Concrete Floor and Slab Construction.

1.03 SUBMITTALS

- A. Quality control/assurance:
 - 1. Summary of test results per paragraph 9.3 of ASTM E1745.
 - 2. Summary of independent testing documenting laboratory and in-field termite resistance testing.
 - 3. Manufacturer's samples and literature.
 - 4. Manufacturer's installation instructions for placement, seaming, penetration prevention and repair, and perimeter seal per ASTM E1643 and any additional procedures to account for subterranean termite protection.
 - 5. Provide documentation that all mandatory ASTM E1745 testing has been performed on a single production roll per ASTM E1745 Section 8.1.
 - 6. Contact termite/vapor barrier manufacturer to schedule a pre-construction meeting and to coordinate a review, in-person or digital, of the vapor barrier installation.
 - 7. Termite/Vapor barrier manufacturer must warrant in writing that the termite barrier (a) will prevent subterranean termite infestation caused by termite penetration of the termite/vapor barrier for a period of five (5) years from the Date of Installation; (b) is constructed without the use of chemical termiticides; (c) complies with the designated ASTM E1745 classification for the Life of the Building, and (d) no manufacturing defects in the product for, at least, the Life of the Building.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Termite/Vapor barrier shall have all of the following qualities:
 - 1. Maintain permeance of 0.01 Perms [grains/(ft² · hr · inHg)] or less as tested in accordance with mandatory conditioning tests per ASTM E1745 Section 7.1 (7.1.1-7.1.5).
 - 2. Other performance criteria:
 - a. Puncture Resistance per ASTM D4833: 137 Newtons
 - b. ASTM E1745 Class C Minimum
 - c. Thickness: 15 mils minimum
- B. Termite/Vapor barrier products:
 - 1. Basis of Design: Pango Wrap Termite/Vapor Barrier (15-mil) marketed by Stego Industries LLC., (877) 464-7834 www.stegoindustries.com.
 - 2. No substitutions.

2.02 ACCESSORIES

- A. Seams:
 - 1. Pango Tape marketed by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.
- B. Penetrations of Termite/Vapor barrier:
 - 1. Pango Tape marketed by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.
 - 2. Pango Claw marketed by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.
 - 3. Pango Bond marketed by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.
 - 4. Pango Sealant marketed by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.
 - 5. Pango Sealant Form marketed by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.
- C. Perimeter/edge seal:
 - 1. Pango Claw marketed by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.
 - 2. Pango Bond marketed by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.
 - 3. Pango Term Bar marketed by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.
- D. Penetration Prevention:
 - 1. Beast Foot by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.
 - 2. Beast Form Stake by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.

February 27, 2026

E. Vapor Barrier-Safe Screed System

1. Beast Screed by Stego Industries, LLC, (877) 464-7834
www.stegoindustries.com.
2. Beast Hook by Stego Industries, LLC, (877) 464-7834
www.stegoindustries.com.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Ensure that subsoil is approved by Architect or Geotechnical Engineer.
1. Level and compact base material.

3.02 INSTALLATION

- A. Install vapor barrier in accordance with ASTM E1643 and manufacturer's instructions.
1. Unroll Pango Wrap Termite/Vapor Barrier with the longest dimension parallel with the direction of the concrete placement and face laps away from the expected direction of the placement whenever possible.
 2. Extend Pango Wrap Termite/Vapor Barrier to the perimeter of the slab. If practicable, terminate it at the top of the slab, otherwise (a) at a point acceptable to the structural engineer or (b) where obstructed by impediments, such as dowels, water stops, or any other site condition requiring early termination of the vapor barrier. At the point of termination, seal Pango Wrap Termite/Vapor Barrier to the foundation wall, grade beam or slab itself.
 - a. Seal Pango Wrap Termite/Vapor Barrier to the entire slab perimeter using Pango Claw, per manufacturer's instructions.
 - b. For other conditions such as grade beams and stem walls, provide per manufacturer's instructions.
 3. Overlap joints a minimum of 6 inches and seal with manufacturer's seam tape.
 4. Apply Pango Tape and Pango Claw to a clean and dry membrane.
 5. Seal all penetrations (including pipes) per manufacturer's instructions.
 6. For interior forming applications, avoid the use of non-permanent stakes driven through vapor barrier. Use Beast Form Stakes and insert them into Beast Foot. Ensure Beast Foot's peel-and-stick adhesive base is fully adhered to Pango Wrap.
 7. Avoid the use of stakes driven through vapor barrier. Utilize Beast Screed and Beast Form Stake, or an alternate screeding/forming system that will not puncture the vapor barrier.
 8. Use reinforcing bar supports with base sections that eliminate or minimize the potential for puncture of the vapor barrier.
 9. Repair damaged areas prior to concrete placement by cutting patches of Pango Wrap Termite/Vapor Barrier, overlapping damaged area a minimum of 6 inches and taping all sides with Pango Tape.

END OF SECTION

DIVISION 2 – SITE CONSTRUCTION

SECTION 02300 – EARTHWORK

PART 1 -GENERAL

1.01 SCOPE OF WORK

- A. This section provides for furnishing of all labor, materials and equipment necessary to perform all earthwork indicated on the drawings and specified herein.

1.02 GENERAL REQUIREMENTS

- A. All work shall be done in accordance with:
 - 1. Ordinance No. 808 to amend Chapter 22, Article 8, Kauai County Code 1987, Relating to Grading, Grubbing and Stockpiling.
 - 2. Title 11, Chapter 54 “Water Quality Standards”;
 - 3. Title 11, Chapter 55 “Water Pollution Control”;
 - 4. Title 11, Chapter 60.1 “Air Pollution Control”,
 - 5. Project Geotechnical Report (“Soils Report”)
- B. Grading shall be carried to the lines and grades as shown on the drawings or as directed by the Owner’s Representative.

1.03 SUBSURFACE SOIL INVESTIGATION

Subsurface soils investigations have been made and are available for inspection at the office of the State and are available from the owner (“Soils Report”). The information and data furnished is the product of facts gathered in investigations made at the specific locations indicated to aid in the design of the project, and no assurance is given that the conditions are necessarily typical of conditions at other locations or that such conditions remain unchanged. The Contractor shall be solely responsible for all assumptions, deductions, or conclusions he may make or derive from the subsurface information or data furnished.

1.04 PROJECT RECORD DOCUMENTS

Maintain existing utilities and accurately record location of newly encountered utilities that are to remain, re-routed utilities and new utilities by horizontal dimensions, elevations or inverts and slope gradients.

PART 2 -GENERAL

2.01 MATERIALS

- A. Material imported or excavated on the property may be utilized in the fill, provided each material conforms to the specifications herein. Roots, tree branches, and other deleterious materials missed during clearing operations shall be removed from the fill. All excavated and imported material used for fill shall conform to the recommendations in the Soils Report.
- B. Material that is spongy, subject to decay or otherwise considered unsuitable shall not be used in the compacted fill.

PART 3 -EXECUTION

3.01 CONTRACTOR'S AND SOILS ENGINEER'S RESPONSIBILITIES

- A. The Contractor shall retain their own Soils Engineer to ensure compliance and fulfill the requirements of the project and other applicable jurisdictions including any monitoring and testing performed to ensure compliance with the Soils Report, Project Drawings and these Specifications.
- B. The Owner may elect to retain the licensed Engineer signing the Soils Report in Section 102.A, as the owner's representative on the project. However, the Owner's representative roles and responsibilities shall not relieve the contractor of monitoring and inspections/testing required to comply with the requirements of the plans, specifications and Soils Report.
- C. The words "supervision", "inspection", or "control" shall mean periodic observation of the work (and the taking of soil tests as deemed necessary) by the Soils Engineer for substantial compliance with plans, specifications and design concepts.
- D. The presence of the Soils Engineer and/or the owner's representative will be for the purpose of providing observation and/or field testing. The service does not include supervision or direction of the actual work of the Contractor, his employees or agents. The Contractor should also be informed that neither the presence of the field representative nor the observation and testing shall excuse him in any way for defects discovered in his work. It is understood that the Soils Engineer will not be responsible for job or site safety on this project. Job and the site safety will be the sole responsibility of the Contractor.
- E. All clearing, site preparation or earthwork performed on the project up to the approximate finish grade or roadway subgrades shall be conducted by the Contractor under the inspection of the Soils Engineer.
- F. It is the Contractor's responsibility to prepare the ground surface to receive the fills and to place, spread, mix, moisture condition, and compact the fill in accordance with the specifications herein. The Contractor shall also remove all unsuitable and deleterious materials.

February 27, 2026

- G. It is also the Contractor's responsibility to have suitable and sufficient compaction equipment on the job site to handle the amount of fill being placed. If necessary, excavation equipment shall be shut down to allow completion of compaction. Sufficient watering apparatus will also be provided by the Contractor with due consideration for the fill material, rate of placement, and the time of year.
- H. It is the responsibility of the Soils Engineer to promptly notify both the Contractor and the Owner's Representative verbally of any failing compaction tests or lack of compliance with specifications. These items shall also be documented by the Soils Engineer.

3.02 SITE PREPARATION

- A. All vegetation and deleterious materials such as rubbish shall be cleared and disposed of off-site. This removal shall be completed prior to excavating and filling.
- B. Soil or rock materials determined as being unsuitable for placement in compacted fill shall be removed and wasted off-site. Any material incorporated as a part of the compacted fill must be approved by the Soils Engineer. Organically contaminated topsoil shall be stripped prior to actual grading.
- C. Any abandoned underground structures such as cesspools, cisterns, tunnels, septic tanks, wells, pipelines, or others not located prior to grading are to be removed and the resulting depression backfilled and compacted in accordance with these specifications.
- D. In areas to be filled and at finished subgrade elevation in cut or excavated areas should be scarified to a depth of 10 inches, moisture-conditioned to above the optimum moisture content, and compacted to a minimum of 90 percent relative compaction.
- E. Where soft or unstable conditions are encountered during these operations, the Soils Engineer shall be notified immediately so that supplemental recommendations can be made prior to the commencing of fill placement.
- F. Any cavities revealed by the subgrade inspection and/or proof-rolling shall be excavated and replaced with compacted structural fill, lean concrete, flowable fill or grout.
- G. Areas under structures, footings and foundations shall be probed for cavities under the observation of the Soils Engineer and treated as recommended in the Soils Report.
- H. When the embankment is to be constructed on an existing slope exceeding five:one (5:1) horizontal to vertical, the existing slope shall be benched by horizontal terraces into firm ground prior to fill placement. The fill shall be placed beginning in the lowest elevations.

3.03 COMPACTED FILLS

- A. Material used in the construction of the structural fills which underlie structures or pavements shall be evenly spread; moisture conditioned to at least 2 percent

- above the optimum moisture content and compacted in horizontal lifts not exceeding 8 inches in loose thickness and compacted to a minimum of 90 percent relative compaction as determined by ASTM D 1557. Non-structural fills for landscaping and general fill areas shall be moisture conditioned to above the optimum moisture and compacted to at least 90 percent relative compaction as determined by ASTM D 1557.
- B. The fill shall be placed and compacted on a horizontal plane with a sufficient gradient to prevent ponding of water in the fill. Saturation and subsequent "pumping" of the fill due to inclement weather and lack of drainage shall require scarification and recompaction of the material by the Contractor at the Contractor's expense.
 - C. Except where the finish grade or subgrade has been attained, should the selected type of compaction equipment result in a sufficiently polished surface after compaction to prevent proper bonding of subsequently placed fill materials, shallow scarification of this surface shall be completed.
 - D. If the moisture content or dry density varies from that specified, the Contractor shall rework the fill until the specified levels of compaction and moisture content are attained. Additional fill material shall not be placed on any fill layer, which has not been properly compacted. Subsequent removal of any unacceptable layer shall be done at the Contractor's expense.
 - E. The Contractor shall be required to obtain the above-specified levels of compaction out to the finish slope face of fill slopes. This may be achieved by overbuilding the slope and cutting back to the compacted core; or by direct compaction of the slope face with suitable equipment, or by any other procedure, which produces the required compaction.
 - 1. If a method other than overbuilding and cutting back to the compacted core is to be employed, slope tests will be made by the Soils Engineer during construction of the slopes to determine if the required compaction is being achieved.
 - 2. If the method of achieving the required slope compaction selected by the Contractor fails to produce the necessary results, the Contractor shall rework or rebuild such slopes until the required degree of compaction is obtained, at no additional cost to the owner.
 - F. Fill placed against previously graded cut or fill slopes shall be properly keyed through topsoil or loose slope material into firm material, and the transition stripped of loose material prior to fill placement. Fill shall be placed and compacted from the low side up.
 - G. All fill slopes should be planted or protected from erosion.

3.04 EXCAVATIONS

- A. Excavated on-site materials may be utilized as compacted fills as specified in Section 02100 – SITE PREPARATION, Part 3, Section 3.03 (CLEARING AND GRUBBING) and the Soils Report.

February 27, 2026

- B. Subgrade materials that are determined to be unsuitable or unsatisfactory for its intended use shall be overexcavated to such depth and width as required by the field conditions.
- C. Materials determined to be unsuitable by the Soils Engineer shall be wasted off-site.
- D. Over-excavated areas, whether due to Contractor's error or the encountering of unsuitable materials, shall be brought back up to grade with approved fill materials, uniformly compacted as required in the Soils Report.
- E. Excavation of the slopes shall be finished with all slopes cut true and straight as shown by the plans and in conformance with the Revised Ordinances of Kauai Chapter 22, as related to Grading, Soil Erosion and Sedimentation Control, and the recommendations of the Soils Report.
- F. No cut slopes shall be excavated higher or steeper than that allowed by the ordinances of the controlling governmental agencies.
- G. Overexcavation or overcutting of the slope due to the Contractor's negligence shall be corrected to the satisfaction of the Owner and Soils Engineer at the Contractor's expense.
- H. If any conditions not described in the contract documents such as perched water, seepage, lenticular or confined strata of a potentially adverse nature are encountered during grading, these conditions shall be immediately brought to the attention of the Owner's Representative, owner and the Soils Engineer so that supplementary recommendations can be made to treat these problems.

3.05 GRADING CONTROL

- A. Observation of the fill placement shall be provided by the Soils Engineer during the progress of grading.
- B. Compaction testing shall be performed in accordance with the recommendations in the Soils Report.
- C. Where failing tests occur or other field problems arise, the Contractor and the Owner's Representative will be verbally notified of such conditions followed by written communication from the Soils Engineer.

3.06 PAVEMENTS

The subgrade soils below the pavement areas shall be scarified, compacted to at least 95 percent relative compaction, proof-rolled and tested in accordance with the recommendations in the Soils Report. The base and subbase material including thickness requirements of the roadway pavement shall be as recommended in the Soils Report and as required by the Standard Specifications for Public Works Construction. The base and subbase material shall be placed and compacted as recommended in the Soils Report and as required by the "Standard Specifications for Public Works Construction."

3.07 FINISHING

February 27, 2026

The completed excavation and fill surfaces shall be true to the grade and elevation shown on the plans and shall provide a firm base. Finished surfaces shall also conform to the slopes and drainage patterns shown on the plans. Tolerances shall be 0.02 feet for the road areas and 0.10 feet for other areas.

3.08 BENCHMARKS

Protect and maintain benchmarks, monuments, and other reference points; if disturbed or destroyed, replace to original state.

3.09 UTILITY LINES

Existing utility lines indicated or locations of which are made known to the Contractor prior to excavation, and that are indicated to be retained, as well as utility lines constructed during excavation operations, shall be protected from damage during excavating and backfilling, and if damaged, shall be repaired at no additional cost to the Owner. If utility lines, that are not indicated or that the Contractor is not aware of, are encountered or damaged, the Owner's Representative shall be notified immediately.

3.10 SPECIAL CONSIDERATIONS

- A. Erosion control measures shall be provided by the Contractor during grading and prior to the completion and construction of permanent drainage controls. The Contractor shall be responsible for providing protection to graded areas against action of the elements.
- B. Upon completion of grading or temporary interruption of grading and the subsequent termination of inspection by the Soils Engineer, no further filling or excavating shall be performed without notifying the Owner's Representative and Soils Engineer in advance and ascertaining their requirements.

Care shall be taken by the Contractor during final grading to preserve any berms, interceptors, swales, drainage terraces or other devices of a permanent nature on or adjacent to the property.

END OF SECTION

DIVISION 2 – SITE CONSTRUCTION

SECTION 02302 – TRENCHING, EXCAVATION, AND BACKFILLING FOR UTILITIES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This item shall consist of trenching, excavating, and backfilling for utilities and their appurtenances complete. Except as specified otherwise herein, the work shall be in accordance with Section 02300 – EARTHWORK.

PART 2 - PRODUCTS

2.01 BACKFILL MATERIALS

- A. Backfill the trench with excavated on-site materials or imported materials as described herein below.
 - 1. Place a 6-inch thick granular bedding consisting of No. 3B fine gravel in accordance with ASTM C33, No. 67 gradation. Place S4C material for backfill and pipe cushion for water lines where the invert of the water pipe is above the 4-foot elevation, USGS Datum. Do not use S4C material in areas where the ground is wet. For the first lift from the bottom of the pipe to 12 inches above the pipe barrel, install granular material such as cushion fill, No. 3B fine gravel in accordance with ASTM C33, No. 67 gradation.
 - 2. Above the shading zone, trench backfill material should consist of approved onsite or imported soil conforming to the criteria stated previously.

PART 3 - EXECUTION

3.01 EXCAVATION

- A. Trenching:
 - 1. Trenching shall be carried to the lines and depths indicated and required for the proper installation of structures. The bottom of the trenches shall be excavated to sufficient depth for the installation of bedding material. Trenches shall be excavated to a minimum of 6 inches on either side of the piping or structures, and to such additional widths as required for proper installation and inspection. The bedding material supporting the piping shall be compacted and shaped to fit the bottom quadrant of the piping with allowance for bells and joining. Trenches shall be kept dry and clean and shall be properly protected from the entry of surface water.
- B. Unsuitable Materials

February 27, 2026

1. When unsuitable material is encountered at the trench excavation, the Contractor shall be responsible for hauling and disposing of the material.

C. Additional Excavation

1. When the subgrade material below the established trench grade is unstable, such as muck, buried debris or lava cavities, excavate below grade to such depth and width as directed by the Soils Engineer. Fill the excavated area below grade with structural fill or crushed rock cushion fill to within 6 inches of the invert grade or to the bottom of the concrete jacket or cradle.

D. Over-Excavation

1. Refill and compact any part of the trench bottom excavated below the established grade with structural fill material to within 6 inches of the pipe invert or to the bottom of the concrete jacket or cradle.
2. Trench backfill materials shall be homogenous and shall extend horizontally to the limits of trench over-excavation.
3. Contractor shall backfill and compact all over-excavated areas at his own expense.

E. Surplus Material

1. Material resulting from trench and structure excavation shall be used by the Contractor for backfilling, filling and grading to the extent required as specified elsewhere in these specifications. The Soils Engineer shall determine whether or not excavation material is suitable for use as fill. All unsuitable material shall be disposed of off-site by the Contractor.

3.02 BACKFILLING AND COMPACTING

- A. The first lift shall be backfilled by hand shoveling and tamping so that the backfill materials are in contact with the entire periphery of the pipe. Power equipment shall be of the front loader type where unloading of backfill material into the trench can be controlled so that the pipe is not damaged nor moved from its installed position. The backfill shall be compacted to a minimum of 90 percent relative compaction. For utility trenches within the pavement areas, backfill material shall be compacted to not less than 95 percent relative compaction per ASTM Designation D 1557.
- B. The work shall be performed without damage to the pipe and trench and in such a manner, that water will not be impounded.
- C. All trench backfill placed above 12 inches of the top of the pipes shall be compacted in maximum loose lift thickness of 8 inches and mechanically compacted to no less than 90 percent relative compaction unless specifically authorized in writing by the Soils Engineer. The Soils Engineer may require thinner lifts should compaction operations consistently fail to produce the specified compaction requirements. In any event, the required levels of compaction shall be obtained throughout the full depth and width of each layer of backfill.

HAWAII HEALTH SYSTEMS CORPORATION – KAUAI DIVISION

Samuel Mahelona Memorial Hospital

Emergency Department

Project No. 225057-01

Trenching, Excavation, and Backfilling for Utilities

02302-2

February 27, 2026

- D. The compaction requirement of the trench backfill within 2 feet of the finished grade in areas subjected to vehicular traffic shall be a minimum of 95 percent relative compaction.
- E. Mechanical tamper or vibratory compactor may be used in compacting each layer provided that the backfill lift thickness takes into account the size of the compaction equipment used.
 - 1. The Contractor shall be responsible for protecting the pipe or structure while placing and compacting the backfill material.
- F. Jetting shall not be permitted. All backfilling shall be under the observation of the Soils Engineer. The Contractor shall notify the Soils Engineer prior to any backfilling.

3.03 EXISTING UTILITY LINES

- A. All underground lines, which are to remain, shown on the drawings or made known to the Contractor, and are in the path of new sanitary sewer, water or storm drain lines shall be uncovered at points where they are in the path of such new piping. The sizes and invert elevations of the existing pipe and manholes shall be ascertained and any discrepancies, which would prevent the Contractor from laying lines to the established grades shall be brought to the attention of the Owner's Representative immediately and before commencing work.

3.04 RESTORATION OF EXISTING PAVEMENT AND OTHER IMPROVEMENTS

- A. All restoration work shall conform to the requirements of the jurisdictional government agencies and under these specifications. Unless specified otherwise in the proposal, restoration work shall be considered as incidental to the various related items of work.

END OF SECTION

DIVISION 2 – SITE CONSTRUCTION

SECTION 02520 – PAVING, ROADWAY AND MISCELLANEOUS WORK

PART 1 -GENERAL

1.01 SCOPE OF WORK

- A. This section includes preparation of subgrades for road, driveways and parking areas; the furnishing and laying of the select borrow, base course, prime coat, tack coat, asphaltic concrete and/or Portland cement concrete pavements, curbs and gutter, sidewalks, paths and miscellaneous works.

PART 2 -PRODUCTS

2.01 REFERENCED SPECIFICATIONS AND STANDARDS

- A. The following specifications and standards of the issues listed below, including the amendments, addenda and errata, form a part of this specification to the extent required by the references thereto. Paragraphs concerning Measurements and Payments in the sections are not applicable.
 - 1. Hawaii Standard Specifications For Road, Bridge And Public Works Construction, State of Hawaii Department of Transportation dated 1994, and any amendments.
 - 2. Standard Specifications for Public Works Construction, the Department of Public Works, County of Kauai, September 1986, including any amendments.
 - 3. Standard Details for Public Works Construction, the Department of Public Works, County of Kauai, September 1984, including any amendments.

2.02 MATERIALS

- A. Materials, construction, and installations shall conform to the applicable sections of the Hawaii Standard Specifications For Road, Bridge And Public Works Construction, State of Hawaii Department of Transportation, dated 1994 and the Standard Specifications for Public Works Construction of the Department of Public Works, County of Kauai, September 1986, including any amendments.

PART 3 -EXECUTION

- 3.01 Construction and installations shall conform to the applicable sections of the Hawaii Standard Specifications For Road, Bridge And Public Works Construction, State of Hawaii Department of Transportation dated 1994, and the Standard Specifications for Public Works Construction, the Department of Public Works, County of Kauai, September 1986, including any amendments.

Details shall conform to the Standard Details for Public Works Construction, County of Kauai, September 1984, including any amendments, unless shown otherwise.

February 27, 2026

END OF SECTION

DIVISION 2 – SITE CONSTRUCTION

SECTION 02630 – STORM DRAINAGE SYSTEM

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This item shall consist of furnishing and construction of storm drainage system, complete. Trenching and Backfilling are specified in Section 02302 – TRENCHING, EXCAVATION AND BACKFILLING FOR UTILITIES.

1.02 RELATED DOCUMENTS

- A. Drawings and general provisions of the contract, including general and supplementary conditions and Division 01 specification sections, apply to this section.
- B. Related Work Described Elsewhere:
 - 1. Section 02100 – Site Preparation
 - 2. Section 02300 – Earthwork
 - 3. Section 02302 – Trenching, Excavation, and Backfilling for Utilities
 - 4. Uniform Building Code, current Edition, Chapter 12 “Building Code”.
 - 5. Uniform Plumbing Code, current Edition, Chapter 14 “Plumbing Code”.

PART 2 - PRODUCTS

2.01 APPLICABLE DOCUMENTS

The following specifications and standards of the issues listed and referred to in this section (including addenda, amendments, and errata listed) form a part of this specification to the extent required by the references thereto.

- A. Uniform Plumbing Code, 2018 Edition, and Kaua’i County Code, Chapter 14 “Plumbing Code”.
- B. Standard Details For Public Works Construction, Department of Public Works, County of Kauai, September 1984, including any amendments.
- C. The applicable provisions for the following sections of the Standard Specifications for Public Works Construction of the Department of Public Works, County of Kauai, September 1986, and any amendments thereto shall govern the construction. Sections concerning measurement and payment are not applicable.

February 27, 2026

SECTION	DESCRIPTION
24	Drain Pipes
25	Drain Manholes
26	Catch Basins and Storm Water Inlets
27	Concrete Channels
28	Subsurface Drains
39	Portland Cement Concrete
40	Concrete Structures
44	Concrete Rubble Masonry
48	Reinforcing Steel

- D. The applicable provisions from the Hawaii Standard Specifications For Road, Bridge And Public Works Construction, State of Hawaii Department of Transportation dated 1994, and any amendments.

2.02 MATERIALS

- A. Drainpipe shall be High Density Polyethylene Pipe (HDPE) unless otherwise indicated on the plans. All subdrain pipe shall be HDPE.
- B. Mortar shall be composed of one part Portland cement and two parts sand or fine aggregate by volume. Fine aggregate and sand shall conform to AASHTO Designation M 45.
- C. High Density Polyethylene Pipe (HDPE) shall conform to AASHTO M252 or M294 Type C or Type S. Fittings shall be of the same material as the pipe.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. General: Each pipe shall be carefully inspected before and after it is installed and any cracked, broken or defective pipe shall not be used. Proper equipment and facilities shall be provided for handling and positioning the pipe. Pipe shall be laid with bells or grooved ends pointing up grade. Spigots shall be centered in bells, and tongues in grooves, to permit proper jointing and to keep the interior of the pipes in proper alignment. Open ends of piping shall be kept closed and covered when work is not in progress.
- B. Installation of Joints:
1. Joint for pipe using flexible, water-tight, rubber-type gaskets: Installation of joints shall be in accordance with the recommendations of the manufacturer of the joint material, as approved by the Engineer.
- C. Cleanouts: Provide cleanouts where shown on the drawings and as required by Plumbing Code.

3.02 PROTECTION OF PIPING & STRUCTURES

February 27, 2026

- A. All work shall be protected from damage or improper alignment. Open ends of unfinished work shall be plugged, capped, and covered to prevent the entrance of foreign materials.

3.03 BUILDING CONNECTIONS

- A. Connections shall be made up to 5 feet from the buildings. If the drain lines are laid before the house plumbing is completed, advance risers shall be installed at the ends of the drain lines. The risers shall be extended above finish grade and marked until connections are completed.

3.04 FINAL INSPECTION

- A. Before Final Inspection, ensure storm drain lines and manholes are free from sand, silt or other obstructions.

END OF SECTION

SECTION 02740 – ASPHALT CONCRETE PAVING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

Related Work Described Elsewhere:

- A. Pavement striping is specified in Section 02760 – Pavement Marking and Signage.
- B. Earthwork is specified in Section 02300 – Earthwork.
- C. The work in this Section is specified in the following sections of the Department of Public Works (DPW) Standard Specifications:
 - 1. Section 29 – Subgrade
 - 2. Section 31 – Aggregate Base Course
 - 3. Section 33 – Asphalt Surface Treatment
 - 4. Section 34 – Asphalt Concrete Pavement

All references to measurement and payment shall be deleted.

1.02 DESCRIPTION

Work under this section consists of furnishing all labor, materials and equipment to complete the asphalt concrete paving as shown on the Drawings and as specified herein.

1.03 SOILS TESTING AND ANALYSES

A Soils Engineer or technician shall be present at the site to observe and direct paving operations and to take density or make visual tests as appropriate. Where low density test results are noted, the area shall be reworked by the Contractor and retested.

If the field observations and test results, in the opinion of the testing personnel or Soils Engineer indicate that the paving is not in general conformance to the intent of the Drawing and Specifications, the discrepancy shall be reported to the Contractor for corrective action with the Owner's Representative notified.

1.04 SUBMITTALS

- A. Submit manufacturer's certificates of conformance for each type of bituminous material and for the job mix formula.

- B. Submit certification that the specified herbicides were applied at the specified application rate over the entire subgrade to be paved.

PART 2 – PRODUCTS

2.01 ASPHALT CONCRETE PAVEMENT MATERIALS

Materials for asphalt concrete pavements shall be in accordance with the below-listed sections of the DPW Standard Specifications, except as amended in the plans and/or specifications herewith.

A. Base Course, 1½-inch Maximum	Section 31
B. Prime Coat for Pavement, MC30	Section 33
C. Tack Coat for Pavement, SS-1 or SS-1H	Section 33
D. Asphalt Concrete Pavement, Mix 4	Section 34

2.02 HERBICIDES

- A. Pre-Paving Vegetation Destruction: Herbicide shall be Roundup by Monsanto or accepted equivalent.
- B. Pre-Emergence Control: Herbicide shall be Treflan by Elanco Products Company or accepted equivalent.

PART 3 – EXECUTION

3.01 SURFACE PREPARATION

- A. The subgrade shall be prepared and compacted in accordance with the requirements of the DPW Standard Specifications. Soil tests shall be made at the subgrade level and the final pavement structure verified or modified as necessary.
- B. Apply pre-paving herbicide to all new pavement areas. Application shall not be made immediately after heavy rains or when rain is forecasted within the next 48 hours. The herbicide shall be applied in accordance with the manufacturer's recommended procedures and rates. Perform two herbicide applications at least three days apart.

3.02 AGGREGATE BASE COURSE

- A. The base course shall be constructed in accordance with Section 31 of the DPW Standard Specifications. Field density tests shall be made by the Soils Engineer to verify that the compaction obtained meets the Specifications.

- B. Apply pre-emergence herbicide on the prepared base for new asphalt concrete pavements in accordance with the manufacturer's recommendations.

3.03 ASPHALT CONCRETE PAVEMENT

- A. The asphalt concrete pavement shall be constructed in accordance with Section 34 of the DPW Standard Specifications.
- B. Smoothness. The finished surface of the pavement shall be true to grade and cross section, free from depressions and grainy spots, and of uniform texture. It shall not vary more than 1/8 of an inch over 10 feet.
- C. Surface Tolerance. The finished surface of the asphalt concrete pavement shall be within 0.02 feet above or below the theoretical grade.

3.04 PAVEMENT STRIPING

Pavement striping shall be as specified in Section 02760 – Pavement Marking and Signage.

END OF SECTION

DIVISION 2 – SITE CONSTRUCTION

SECTION 02760 – PAVEMENT MARKING AND SIGNAGE

PART 1 -GENERAL

1.01 RELATED DOCUMENTS

- A. The work in this Section shall be in accordance with the appropriate Sections of the Hawaii Standard Specifications For Road, Bridge And Public Works Construction, State of Hawaii Department of Transportation, dated 1994/2005, including any amendments. Paragraphs concerning Measurements and Payments in the sections are not applicable.
 - 1. These specifications shall amend Section 629 – Pavement Markers, Striping and Markings of the DOT Standard Specifications.
 - 2. These specifications shall amend Section 621 – Destination, Directional, Regulatory and Warning Signs of the DOT Standard Specifications.
 - 3. These specifications shall amend Section 755 – Pavement Marking Materials of the DOT Standard Specifications
 - 4. All references to measurement and payment shall be deleted.
- B. Related Work Described Elsewhere:
 - 1. Roadway paving is specified in Section 02740 – ASPHALT CONCRETE PAVING.
 - 2. Concrete paving is specified in Section 02750 – PORTLAND CEMENT CONCRETE PAVEMENT.

1.02 DESCRIPTION

- A. Work under this Section consists of furnishing all labor, materials and equipment to complete the roadway striping, pavement markers and signage on the Drawings and as specified herein.

1.03 SUBMITTALS

- A. Submit manufacturer's documentation(s) of compliance to the requirements listed herein, including but not limited to Certifications, Manufacturer's Product Data Sheets, and Manufacturer's Material Safety Data Sheets, for all materials herein specified.

PART 2 – PRODUCTS

2.01 TRAFFIC PAINTS

- A. Reflectorized traffic paint shall conform to the requirements of Premixed Reflectorized White and Blue Traffic Paint.
- B. Only those traffic paints which have qualified in the latest completed prequalification tests conducted by the State Department of Transportation and having a Weighed Rating (W) of at least 6.5 for reflectorized white and for reflectorized blue at the completion of the road test will be permitted for use on this project. Quick-dry paints shall not be used.
- C. The phrase "latest completed prequalification tests" shall mean either those traffic paints which have been prequalified by the State Department of Transportation at the time this Contract becomes effective or those traffic paints which have been listed by the State Department of Transportation as meeting the State Department of Transportation's prequalification tests at the time the Contractor is doing the pavement striping.
- D. The following Traffic Paints are acceptable:

Type	Brand	Stock Order Formula No.
Pre-Mixed Reflectorized, Water Borne, White Traffic Paint	Centerline Company Centerline Morton Pervo Ameritone	CL-5022 CL-6044 2683A9 6000R 022683
Pre-Mixed Reflectorized, Solvent Based, White Traffic Paint	J.E. Bauer Company J.E. Bauer Morton (Centerline) Pervo	892A9 2581A9 8036C1 5550R
Ready-Mixed, Reflectorized Water Borne, Lead-Free, Blue Traffic Paint	In accordance with Federal Spec No. TT-P-1952D	In accordance with Federal Spec No. TT-P-1952D

2.02 PAVEMENT MARKERS

- A. Markers: Rectangular, clear, highly impact resistant plastic top embossed with striated prismatic patterns on the underside. Underside is lined with a highly polished reflectorized plastic lens which is colored yellow for roadway centerlines or blue for fire hydrants. Interior of top is filled with a poured material which reinforces the impact resistant plastic top. Reflector shall meet requirements of the State Standard Specifications.

February 27, 2026

- B. Adhesive: Provide standard set type or rapid set type pavement marker adhesive compatible with roadway surface in compliance with the DOT's Hawaii Standard Specifications For Road, Bridge And Public Works Construction.
- C. Adhesive solvent: Provide manufacturer's recommended solvents to remove excess adhesive from roadway or marker.

2.03 SIGNS

- A. Signs shall conform to the requirements of the Manual on Uniform Traffic Control Devices for Streets and Highways, 2023 Edition, as amended, by the Federal Highway Administration.

2.04 SIGN POSTS

- A. Sign posts shall be square tube with anchor sleeves. Posts shall be FHWA approved for breakaway standards.

PART 3 – EXECUTION

3.01 CONSTRUCTION REQUIREMENTS

- A. Work shall conform to the requirements of Section 629.03 of the Hawaii Standard Specifications For Road, Bridge And Public Works Construction and as herein below specified.
- B. Before application of the markings, the portion of the roadway surface in the work area shall be thoroughly cleaned of all dust, dirt, curing compound, grease, oil, moisture, loose or unsound layers and any other material which would adversely affect the bond of the markings.
- C. Traffic stripes shall be of the length, width, and placement specified or to match existing. Unless otherwise specified, the Contractor shall establish control points, satisfactory to the Engineer, spaced at intervals that will insure accurate locations of the stripe.
- D. No markings shall be applied when moisture or foreign matter is present on the surface to be marked, or when wind conditions are such as to cause dust to be deposited on the prepared areas or to prevent satisfactory application of the marking.
- E. The Contractor shall apply all pavement striping before opening roadways to public traffic except that when connections to existing pavements are made or when temporary detours carry public traffic, the Contractor shall stripe the connecting pavements on the day that the roadway is open to traffic. If it is necessary to run public traffic over roadways which have not received final striping, the Contractor shall paint temporary guide dashes at the traffic stripe location on the pavement as guidance for drivers until the permanent striping can be installed.
- F. The Contractor shall install temporary guidelines and outline of legends and crosswalks with a 2-inch wide line on the day the roadway is opened to traffic, which shall be approved by the Engineer before permanent lines are installed.

- G. The Contractor shall furnish and place all warning and directional signs necessary to direct and control the traffic during the striping operations. Warning signs shall be set up before the beginning of each operation and extra signs shall be kept well ahead of the marking equipment. The freshly marked stripe shall be protected by cones or other satisfactory devices until the traffic marking is dry and will not transfer to car tires. The drying time for no pickup shall be not less than 5 minutes or more than 40 minutes. All stripes damaged by traffic, or pavement marked by traffic crossing wet marking, shall be repaired or corrected as specified below.
- H. Perform thermoplastic marking in accordance with the requirements of Section 629.03(C)(3) of the Hawaii Standard Specifications For Road, Bridge And Public Works Construction.
- I. Traffic paint shall be applied in two separate coats at a nominal film thickness of 0.015 inch. The traffic paint applicator machine shall have appropriate shields or nozzle controls which will permit sharp pavement stripe definition. The traffic paint applicator machine shall have an air stream nozzle which can direct compressed air immediately before the area of paint application for the purpose of cleaning the pavement prior to paint application.
- J. Pavement legends shall be applied with appropriate templates.
- K. No stripe shall be less than the specified width. No stripe shall exceed the specified width by more than 2 inches. The length of the 15-foot painted segment for skip stripe may vary plus or minus 1 foot and the 25-foot gap between segments may vary plus or minus 1 foot. The alignment of the stripe shall not deviate from the intended alignment by more than 1 inch on tangents and on curves up to and including 1 degree. On curves exceeding 1 degree, the alignment of the stripe shall not deviate from the intended alignment by more than 2 inches.
- L. All stripes and segments of stripes shall present a clean-cut, uniform and workmanlike appearance. All markings which fail to have a uniform, satisfactory appearance shall be corrected by the Contractor at his expense.
- M. Traffic striping which fails to meet the requirements specified herein, or is marred or damaged by traffic or from other causes, shall be corrected prior to acceptance by the State at the Contractor's expense. For all misted areas, drip and spattered paint and excess markings shall be removed to the satisfaction of the State. When it is necessary to remove paint or markings, it shall be done by means which will not damage the underlying surface of the pavement. When necessary to correct a deviation which exceeds the permissible tolerance in alignment, that portion of the stripe so affected shall be removed plus an additional 25 feet in each direction, and a new stripe then painted in accordance with these specifications.

3.02 TEST SPECIMENS

- A. The Contractor shall submit to the Owner's Representative test specimens as requested. Test markings shall be applied to a suitable plane rigid surface. The

February 27, 2026

area shall be of sufficient size to permit film thickness measurement to be made at least 1 inch from any edge.

3.03 TRAFFIC SIGNS

- A. Each sign shall be carefully installed in accordance with Section 621.03 of the Hawaii Standard Specifications For Road, Bridge And Public Works Construction at the approximate locations shown on the plans and in accordance with the mounting details indicated. Final locations shall be approved by the Owner's Representative.
- B. Sign posts shall be vertical and there shall be a minimum of 7 feet clearance to the bottom of the sign.
- C. Construction signs may be mounted on portable frames or supports.
- D. The backside of all metallic signs for parking and traffic shall be painted hunter green in color

END OF SECTION

SECTION 02810 – IRRIGATION SYSTEM

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Materials, equipment and services required to install the complete landscape irrigation system as indicated on Drawings.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 02300 – EARTHWORK
- B. Section 02315 - TRENCHING
- C. Section 02900 – PLANTING
- D. Section 02906 – TREE TRANSPLANTING
- E. Section 16000 – ELECTRICAL

1.03 REFERENCES

- A. ASTM A 126 - Standard Specification for Gray Iron Castings For valves, Flanges and Fittings
- B. ASTM A 536 - Standard Specification for Ductile Iron Castings
- C. ASTM B 32 - Standard Specification for Solder Metal
- D. ASTM B62 - Standard Specification for Composition Bronze or Ounce Metal Castings
- E. ASTM B88 - Standard Specification for Seamless Copper Water Tube
- F. ASTM B 302 - Standard Specification for Threadless Copper Pipe, Standard Sizes
- G. ASTM B 828 - Standard Practice for Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings
- H. ASTM D 1784 - Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
- I. ASTM D 1785 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120
- J. ASTM D 2464 - Standard Specification for Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80
- K. ASTM D 2466 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40
- L. ASTM D 2564 - Standard Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems
- M. ASTM D 3350 – Standard Specification for Polyethylene Plastic Pipe and Fittings Materials
- N. ASTM F 477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe

February 27, 2026

- O. ASTM F 714 - Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter
- P. NEMA 250 - Enclosures For Electrical Equipment
- Q. Water System Standards – Department of Water, County of Kauai; Board of Water Supply, City and County of Honolulu; Department of Water Supply, County of Maui; Department of Water Supply, County of Hawaii; Volume 1 [26].

1.04 QUALITY ASSURANCE

- A. In accord with Section 01440 – QUALITY ASSURANCE AND QUALITY CONTROL.
- B. Workman Qualifications:
 - 1. Contractor with no less than five (5) years of experience installing irrigation systems, similar to the scope and complexity of this project, with documented completion of at least (5) successful installations of commercial, computer-controlled irrigation systems.
 - 2. On-site field superintendent shall have no less than 5 yrs. of continuous experience in the installation of commercial computer-controlled irrigation systems. Supervisor shall remain on site during all specified work in progress.
- C. Tests and Inspections:
 - 1. Do not conceal any work until all required tests and inspections have been completed.
 - 2. Conduct the following tests, inspections and conference with Architect. Provide advanced notification of each according to the times indicated:
 - a. Pre-installation conference: 10 days.
 - b. System layout: 10 days.
 - c. Hydrostatic testing of pressure main line and non-pressure lateral lines installed under paving: 10 days.
 - d. Coverage tests: 10 days.
 - e. Final inspection: 10 days.
 - 3. During final inspection, provide two-way radios and sufficient personnel to provide constant communication between inspection areas and the controller.
 - 4. Hydrostatic tests:
 - a. Furnish force pump and all equipment required to perform hydrostatic testing.
 - b. Center load backfill over pipes, leaving all joints exposed until the installation has been inspected, tested, and accepted by Architect.
 - c. Except for ball valves installed upstream of control valves, all testing shall be completed prior to the installation of all other valves and valve assemblies.
 - d. Perform hydrostatic tests in presence of Architect. Maintain 150 psi pressure in the lines for a period of not less than 30 minutes with pressure not dropping more than 5 psi. If leaks develop, remake joints and repeat

tests until the entire system has proven watertight and is accepted by the Architect.

5. Coverage test:

- a. Upon completion of the sprinkler system and prior to planting of shrubs, ground cover or turf, perform a coverage test in presence of Architect to determine that irrigation coverage for all planting areas is complete and adequate.
- b. Furnish materials and perform work required to correct any inadequacies of coverage. Re-schedule and perform additional coverage test with Architect for acceptance.

6. Final Inspection:

- a. Upon completion of the entire system, schedule and conduct a final inspection of all equipment and perform a coverage test of each valve station with the Project Manager as part of the Final Approval process.
- b. During final inspection, provide two-way radio communication and sufficient personnel to provide constant communication between inspection areas and the controller.

D. Final Acceptance:

1. Prior to final approval of work, all of the following requirements shall be met:
 - a. Landscape irrigation system completed and accepted by Architect.
 - b. Coverage tests completed and accepted by Architect.
 - c. Punch list items completed and accepted by Architect.
2. Maintain irrigation system and sufficient watering schedule until all conditions of acceptance have been completed.
3. Contracted irrigation maintenance period shall begin upon Architect's Final Acceptance.

1.05 PROJECT CONDITIONS

- A. Coordinate work with underground utilities and trades responsible for other underground improvements including the location and planting of specimen trees, and other planting as applicable. Verify locations with Architect of all planting requiring excavations 48 inch in diameter and larger prior to layout of main lines.
- B. Provide temporary irrigation at all times to properly maintain existing planting where required.
- C. Existing Irrigation Systems:
 1. The existing automatic irrigation system shall be maintained in uninterrupted operation for the duration of the work.
 2. All existing irrigation valves and irrigation systems adjacent to the work shall be protected in-place and maintained in operation. Any required disconnection or interruption in existing irrigation shall be coordinated with the Architect in advance of work.

February 27, 2026

3. Water for construction site may be supplied by existing irrigation lines that are flow sensitive. Contractor shall be responsible for any damage to new or existing planting caused by not coordinating installation with the Architect or defeating the flow sensing capabilities.

1.06 PRE-INSTALLATION CONFERENCE

- A. At least two (2) weeks prior to the commencement of work, conduct a pre-installation conference with the Architect. This meeting shall include all parties responsible for installation, scheduling and testing of the finish work under this section.
- B. Review methods and procedures related to the work of this Section, including, but not necessarily limited to the following:
 1. Products and system requirements
 2. Review of required submittals
 3. Review of required details
 4. Schedule and sequencing of work
 5. Coordination with other trades and existing site conditions
 6. Forecasted weather and procedures for coping with unfavorable conditions
 7. Required inspections, reviews and procedures for approvals
- C. Record discussions of conference including all decisions, directions and agreements reached. Furnish copies of record to all parties in attendance.

1.07 SUBMITTALS

- A. In accord with Section 01300 – SUBMITTAL PROCEDURES.
- B. Documentation to substantiate required experience and workman qualifications.
 1. Provide copy of certificates for professional memberships, certifications and training.
 2. List project names, location, address, and telephone number of contact persons for information regarding completed work.
- C. List of materials:
 1. Submit a complete list of materials prior to commencing work. List of materials shall include the name of manufacturer, model number, manufacturer's product cut sheet, and description of each item intended for use in the installation
 2. Irrigation submittal shall be specific and complete. All items shall be listed, including solvent, primer, wire, wire connectors, valve boxes, check valves, and all other items needed to complete work.
 3. Although manufacturer and other information may differ, the following is a guide to the proper format for submittal:

Item	Description	Manufacturer	Model No.
1	Pop-up Sprinkler Bodies	Rain Bird	1800 Series
2	Field Satellite	Rain Bird	ESP-LXD
3	Manual Gate Valves	Nibco	T-113

4. Submit operating manuals and maintenance data of equipment.
 - a. No substitutions of materials or equipment will be allowed without prior written approval by Architect. Refer to Section 01630 - SUBSTITUTION PROCEDURES.
 - b. Any equipment or materials furnished without the prior approval of Architect may be rejected and required to be removed at Contractor's expense.
 - D. Controller charts:
 1. Provide two controller charts for each controller supplied.
 2. Controller charts shall be prepared in AutoCAD. Provide two (2) hard copy prints of controller charts and AutoCAD electronic files on disk.
 3. Controller chart to be a reduced scale drawing of the actual installed system depicting all valve stations from one field satellite or controller. Each valve's area of coverage shall be uniquely identified by a contrasting color to the other adjacent valve stations.
 4. The controller charts are to be completed and approved by Architect prior to final acceptance of the system.
- 1.08 PRODUCT HANDLING
- A. In accord with Section 01660 - PRODUCT STORAGE AND HANDLING REQUIREMENTS.
 - B. Deliver and store products and equipment in manufacturer's unopened packaging until ready for installation.
- 1.09 ADDITIONAL MATERIALS
- A. Furnish the following extra components prior to Final Approval.
 1. Three long-handled valve key each for square nut and hand wheel equipped gate valves.
- 1.10 WARRANTY
- A. Submit warranty documents in accord with Section 01770 – CLOSEOUT PROCEDURES.
 - B. Warranty the entire landscape irrigation system to give satisfactory service, including all equipment and materials for a period of one (1) year from the date of Final Acceptance.
 - C. Warranty the supplemental landscape irrigation system to give satisfactory service for a period of 6 months from the date of its acceptance by Architect.

February 27, 2026

- D. Should any problems develop within the warranty period due to inferior materials or faulty workmanship, correct problems to Architect's satisfaction at no additional cost.
- E. Any damages or re-work required of the landscape or hardscape due to repairs of the irrigation system shall be completed to Architect's satisfaction at no additional cost.
- F. Architect reserves the right to make temporary repairs, as necessary, to keep the landscape irrigation system in an operating condition. Exercising this right does not in any way relieve the contractor of any responsibilities under the terms of the warranty.
- G. Manufacturer's product warranties shall supplement but not relieve the Contractor of any liability from his contracted installation Warranty.

PART 2 - PRODUCTS

2.01 PLASTIC PIPE AND FITTINGS

- A. Potable Pipe shall be marked with Manufacturer's name, nominal pipe size, schedule or class, pressure rating in PSI, and date of extrusion.
 - 1. Non-pressure 'lateral line' pipe: Class 200, PVC plastic, ASTM D1785, Type I, Grade I with solvent welded joints. Use Schedule 40, PVC for all pipe installed under paving.
 - 2. Pressure main line pipe, sizes 2-1/2 inches and smaller: Schedule 40, PVC plastic, ASTM D 1785, Type I, Grade I, with solvent welded joints, and Christy's detectable marking tape, green color with irrigation line below warning.
 - 3. Pressure main line pipe, sizes 3 inches and larger: Schedule 40, PVC plastic, ASTM D 1785, Type I, Grade I with rubber gasketed bell and spigot connections, with Christy's detectable marking tape, green color with irrigation line below warning. Insertion marks shall be visible to show proper depth into spigot.
- B. Fittings shall bear manufacturer's name or trademark, material designation, size, and applicable I.P.S. schedule.
 - 1. Glued socket type, for pipe sizes 2-1/2 inches and smaller; Schedule 40, PVC plastic; Grade I, ASTM D 2466, Type I.
 - a. Solvent cement: ASTM D2546, for PVC pipe and fittings.
 - 2. Threaded type, for pipe sizes 2-1/2 inches and smaller; Schedule 80, PVC plastic; Grade I, ASTM D 2464, and ASTM F 437.
 - 3. Bell-end, sizes 3 inches and larger; Ductile iron, grade 65-45-12 in accord with ASTM A 536, having deep bell push-on joints with gaskets meeting ASTM F477.
 - a. HARCO 'Deep Bell' by the Harrington Corp. of Lynchburg, VA., (804) 845-7094; or Architect-approved equivalent.
 - b. Transition gaskets are not allowed.

February 27, 2026

2.02 COPPER PIPE AND FITTINGS

- A. Type K, hard tempered pipe, ASTM B 88.
- B. Solder joint type wrought copper fittings, ASTM B 828.
- C. 95/5 solder, ASTM B 32.

2.03 FLEXIBLE TUBING

- A. Rain Bird Swing Pipe, Toro 850-01, or equal thick wall flexible pipe.

2.04 CONDUIT

- A. Gray PVC Schedule 80 conduit with solvent weld fittings.
- B. Use separate conduits for each type of wire or cable run.
- C. Size conduits as indicated on Drawings or as required to accommodate anticipated number of wires without binding or damaging wire insulation.

2.05 SLEEVES

- A. Schedule 40 PVC for applications requiring 3 inches and smaller diameter.
- B. Class 200 PVC for applications 4 inches and larger.
- C. All sleeves shall be 2 pipe sizes larger than the diameter of the protected pipe run for pipe under 6 inches diameter and 2 pipe sizes larger for runs 6 inches and larger.

2.06 CONTROL WIRE

- A. Low-Voltage, Branch Circuit Cables:
 - 1. UL 1551, Type PE single solid-copper conductor; polyethylene insulation; suitable for direct burial.
 - 2. Control Wire: 14 AWG minimum between irrigation controller and automatic control valves.
 - 3. Common Wire: 12 AWG between all valves and home-run to irrigation controller.
- B. In all cases, wire size and specifications shall meet the minimum requirements of the installation instructions and recommendations of the manufacturer of the irrigation controller. Wire Connectors: DBR/Y-6 direct bury splice kits by 3M with 'Scotchlok'™ connectors.

2.07 BACKFLOW DEVICE

- A. Backflow Device: As indicated on Drawings.

February 27, 2026

2.08 VALVES

A. Gate Valves:

1. Manual Gate Valves 2-1/2 inches and smaller:

- a. Nibco T-113 or Architect-approved equivalent that includes the following options; 200 lb. saturated steam rated brass body, ASTM B62, with threaded joints, non-rising stem, screwed bonnet and bronze hand wheel.

B. Electric Control Valves: Type and size as indicated on Drawings.

C. Quick Coupler Valves: Type and size as indicated on Drawings.

2.09 CONTROLLERS

A. As indicated on Drawings.

B. Controller Cabinet:

1. Pedestal Mount: Strong Box SB-24SS, as manufactured by V.I.T. Products, Inc. ph (800) 729-1314
2. NEMA Type 3R rating with thermostatically controlled fan and louvered-vent filters
3. Include a minimum of two (2) GFCI receptacles within controller enclosure.
4. Include stainless steel pedestal as manufactured by V.I.T Products, Inc. to match controller cabinet.

2.10 SPRINKLER HEADS

A. Sprinkler Heads: As specified on Drawings.

B. Rotator Heads: As specified on Drawings.

2.11 DRIP IRRIGATION

A. Drip Emitters and Tubing: As specified on Drawings.

B. In all cases, inline dripline zones shall be constructed with a PVC supply manifold and a PVC exhaust/flush manifold.

C. All inline dripline zones shall include a manual flush valve plumbed to exhaust/flush manifold and installed in round valve box as indicated on the Drawings.

D. Install an air/vacuum relief valve at the highest point of the inline dripline zones as indicated on the Drawings or as required. Air/vacuum relief valve shall be brass or plastic housing, with corrosion-resistant internal parts.

E. Secure inline dripline to grade as recommended by the manufacturer. Install a 2-inch layer of mulch over dripline.

2.12 VALVE BOXES

A. All subgrade valves and valve assemblies located within planting areas are to be installed in black plastic boxes with matching purple lids as manufactured by Rain Bird.

February 27, 2026

1. For manual gate valves; 10 inches x 10-1/4 inches round box with bolt-down cover. Extension sleeve shall be PVC with minimum depth of 6 inches.
2. For Electric Control Valves; 11-3/4 inches x 17 inches x 12 inches rectangular box with bolt-down cover.
3. For quick coupler valves; 10 inches x 10-1/4 inches round box with bolt-down cover.

2.13 VALVE IDENTIFICATION TAGS

- A. Christy brand, Maxi Tag™, manufactured from polyurethane Bayer Desmopan, 3 inches x 4 inches, hot-stamped with black letters on yellow background. Attach one tag to each electric control valve providing field satellite and station numbers.
- B. All valves, regardless of type, shall have 'Reclaimed Water' ID tags attached. Tags shall be Christy brand Maxi Tag™, hot-stamped with black letters on purple background. Tags shall read "Warning - Reclaimed Water - Do Not Drink." Tag shall be printed in English and Spanish.
- C. Special order tags from T. Christy Enterprises, 655 East Ball Road, Anaheim, CA 92805. Ph: (800) 258-4583, Fax: (800) 468-4583.

2.14 DIELECTRIC FITTINGS

- A. General Requirements: Assembly of copper alloy and ferrous materials or ferrous material body with separating non-conductive insulating material suitable for system fluid, pressure, and temperature.
- B. Dielectric Unions:
 1. Factory fabricated union, 2 inches and smaller, 150 psi minimum.
 2. End Connections: Solder-joint copper alloy and threaded ferrous; threaded ferrous.
- C. Dielectric Flanges:
 1. Factory-fabricated, bolted, companion-flange assembly, 2-1/2 inches to 4 inches and larger; 150 psi minimum.
 2. End Connections: Solder-joint copper alloy and threaded ferrous; threaded solder-joint copper alloy and threaded ferrous.
- D. Dielectric Flange Kits:
 1. Non-conducting materials for field assembly of companion flanges, 2-1/2 inches and larger; 150 psi minimum.
 2. Gasket: Neoprene or phenolic.
 3. Bolt Sleeves: Phenolic or polyethylene.
 4. Washers: Phenolic with steel backing washers.
- E. Dielectric Couplings:
 1. Galvanized steel coupling; 300 psi.
 2. End Connections: Female threaded.
 3. Lining: Insert and non-corrosive, thermoplastic lining.

F. Dielectric Nipples:

1. Electroplated steel nipple complying with ASTM F1545; 300 psi.
2. End Connections: Male threaded or grooved.
3. Lining: Inert and non-corrosive; propylene.

2.15 DETECTABLE WARNING TAPE

- A. Provide products by T. Christy Enterprises, 655 East Ball Road, Anaheim, CA 92805. Ph: (800) 258-4583, Fax: (800) 468-4583.
- B. Detectable warning tape shall be installed below ground and be detectable with a non-ferrous metal detector when buried flat at depths recommended by the manufacturer. In all cases, install detectable warning tape according to manufacturer's instructions and recommendations.
- C. Detectable warning tape shall be 5.0 mil overall thickness, five-ply composition. Tape shall have ultra-high molecular weight, consist of 100 percent virgin polyethylene, and be acid, alkaline, and corrosion resistant.
- D. Detectable warning tape shall have a 0.35 mil solid aluminum foil core. Printed text shall be a repeated warning message, reverse printed on a 0.8 mil clear film, and laminated to aluminum foil with a 3.75 mil clear film backing; encapsulated within 2.55 mil polyethylene backing.
- E. Tensile strength of tape shall not be less than 7800 psi and in accordance with ASTM D882-80A.
- F. Elongation properties shall be in accordance with ASTM D882-80A and are less than 150 percent at break point.
- G. Tape color and legend combination shall be in accordance with APWA or local requirements. Tape lettering shall be 1-1/2 inches tall minimum.
- H. Tape width shall be minimum 3 inches wide.
- I. Tape Color: Green and in accordance with APWA or local requirements.
- J. Printed Text on Tape: "Cation Irrigation Line Buried Below" and in accordance with APWA or local requirements.

2.16 MISCELLANEOUS EQUIPMENT

- A. Stakes: #4 rebar – length as noted.
- B. Clamps: Stainless steel screw clamps.
- C. Swing Joints: Dura, Spears, Rain Bird maximum, or Lasco.
- D. Check Valves: KBI, NDS, Nibco, or approved equal.
- E. Concrete: 2500 psi/28-day concrete.

PART 3 - EXECUTION

3.01 GENERAL REQUIREMENTS

- A. Layout of irrigation pipe and equipment indicated on Drawings is diagrammatic. Actual locations are contingent upon actual site conditions and integration with other underground utilities.
- B. Verify dimensions, grades and points of connection in field prior to commencement of work.
- C. Do not proceed with installation when it is apparent that obstructions, grade differences or conflicts in the Drawings exist. Bring all such conflicts or discrepancies to the immediate attention of Architect for clarification.
- D. Obtain and pay all plumbing permits and inspections required by governing agencies.

3.02 SUPPLEMENTAL IRRIGATION

- A. Provide a supplemental drip irrigation system for all palm trees and all boxed trees with root balls 24 inches and larger installed under this contract. This system is to ensure that installed trees will be automatically irrigated during the plant establishment period.
- B. The supplemental system shall be designed by a qualified irrigation design professional that is experienced with drip and low flow irrigation systems.
 - 1. Submit for Architect approval, prior to commencing with work, schematic drawings showing intended drip irrigation design with all pertinent information for temporary water connections, equipment and installation.
- C. System to be installed and operational prior to tree planting, regardless of the availability of a permanent water connection. If permanent irrigation water is not available at the time the system is installed, provide a temporary water connection until a permanent connection can be made.
- D. Pipe and/or tubing, not in a hazardous area, to be installed on-grade. Pipe installed as a part of temporary irrigation shall not be re-used as any part of the permanent landscape irrigation system.
- E. All pipe and/or tubing shall be buried and sleeved under construction or access roads at a proper depth to prevent damage.
- F. Protect temporary system during entire planting process. Repair any damage to landscape caused by leaking or broken lines.
- G. The system should be designed at 90% capacity to allow for additional plant material or emitters as required. Ten percent (10%) additional emitters to be included in contract and installed at Architects discretion.
- H. Use the following table to determine the required quantity of emitters or spray stakes;
 - 1. 1 spray stake/emitter for all rootballs up to 2 feet measured in the largest dimension.
 - 2. 2 spray stakes/emitters for all rootballs up to 4 feet measured in the largest dimension.

February 27, 2026

3. 3 spray stakes/emitters for all rootballs up to 6 feet measured in the largest dimension.
4. 4 spray stakes/emitters for all rootballs up to 8 feet measured in the largest dimension.
- I. Flow rates should be calculated using .25 GPM per emitter.
- J. Upon completion of the permanent irrigation system, remove the supplemental system without damaging landscape. Battery operated controllers and valves shall be turned over to the Owner. Remainder of supplemental materials to be salvaged or properly disposed of off-site.

3.03 PREPARATION

- A. Layout of irrigation pipe and equipment indicated on Drawings is diagrammatic. Actual locations are contingent upon site conditions and integration with other underground utilities.
- B. Verify dimensions, grades, and point of connection in the field prior to commencement of the Work.
- C. Do not proceed with installation when it is apparent that obstructions, grade differences, or conflicts with Drawings exist. Bring all such conflicts or discrepancies to the immediate attention of the Architect for clarification.
- D. Set stakes to identify locations of proposed irrigation system. Obtain Architect's acceptance before excavation.

3.04 POINT OF CONNECTION

- A. Refer to Civil Drawings for points of connection within new valve box.

3.05 TRENCHING

- A. Lay-out system using an approved staking method.
- B. Coordinate routing of mainline piping and trenching with underground utilities and specimen tree locations.
 1. Planting locations shall take precedence over sprinkler and piping locations where possible.
 2. Maintain minimum clearance between pipes as required by code.
 3. Notify and coordinate with Architect of any major deviations from original layout.
- C. Trenching operations shall be done via mechanical or hand methods and to as true a line as possible. Trenching with grader or bulldozer will not be allowed. Excavate trenches with straight and vertical sides. No trench shall be excavated in such a manner that the trench section appears triangular or trapezoidal. Any trench excavated in an objectionable manner, as determined by the Architect, shall be backfilled and re-compacted by the Contractor before retrenching, at no additional cost.
- D. Provide continuous support for pipe on bottom of trenches. Lay pipe to uniform grade.

February 27, 2026

1. Bottom of trench shall be free of rocks, clods, and other sharp-edged objects. The Architect reserves the right to have the trench over-excavated 3 inches and filled with accepted material at no additional cost should the trench bottom contain rocks or other objectionable material.
 2. Trench backfill material shall be on-site or imported select material in accord with Section 02315 – EXCAVATION AND FILL. Backfill material shall be free from rocks greater than 1/2-inch.
 3. Maintain 1-inch minimum clearance between lines which cross at 45-degree to 90-degree angles.
 4. Maintain 6 inches minimum clearance between sprinkler lines and between lines of other trades. Do not install sprinkler lines directly above any other pipes or utilities.
 5. Maintain 12 inches minimum clearance between mainline and potable water lines. Irrigation mainline crossings passing above potable water lines shall be concrete jacketed and conform to “Water System Standards” Department of Water, County of Kauai; Board of Water Supply, City and County of Honolulu; Department of Water Supply, County of Maui; Department of Water Supply, County of Hawaii; Volume 1 [26], county-adopted plumbing code, as amended, and other water purveyor requirements.
- E. Where irrigation lines occur within landscaping, trench depths shall be:
1. Provide minimum cover of 24 inches over all pressure main lines 6 inches and larger. Maximum cover shall be 48 inches unless otherwise approved by Architect.
 2. Provide minimum cover of 24 inches over all pressure supply main lines 4 inches and larger. Maximum cover shall be 48 inches unless otherwise approved by Architect.
 3. Provide minimum cover of 12 inches over non-pressure lateral lines. Maximum cover shall be 18 inches unless otherwise approved by Architect.
- F. Where irrigation lines occur under vehicular paving, depth of coverage shall be measured from the bottom of paving material. Trench depths shall be:
1. Provide minimum cover of 36 inches over all sleeves or direct-bury pressure main lines 6 inches and larger. Maximum cover shall be 48 inches unless otherwise approved by Architect.
 2. Provide minimum cover of 36 inches over all sleeves or direct-bury pressure supply main lines smaller than 6 inches. Maximum cover shall be 48 inches unless otherwise approved by Architect.
 3. Provide minimum cover of 36 inches over all sleeves or direct-bury non-pressure lateral lines. Maximum cover shall be 24 inches unless otherwise approved by Architect.
- G. Where irrigation lines occur under pedestrian walkway paving, depth of coverage shall be measured from the bottom of paving material. Trench depths shall be:
1. Provide minimum cover of 24 inches over all sleeves or direct-bury pressure main lines 6 inches and larger. Maximum cover shall be 36 inches unless otherwise approved by Architect.

February 27, 2026

2. Provide minimum cover of 24 inches over all sleeves or direct-bury pressure supply main lines smaller than 6 inches. Maximum cover shall be 48 inches unless otherwise approved by Architect.
 3. Provide minimum cover of 24 inches over all sleeves or direct-bury non-pressure lateral lines. Maximum cover shall be 36 inches unless otherwise approved by Architect.
- H. Install, under mainline, one continuous No. 14 AWG UF tracer wire in all locations where control wires are not installed in same trench as mainline. Tracer wire shall be black with a white stripe.

3.06 BACKFILLING

- A. Backfill and compaction: In accord with Section 02315 - EXCAVATION AND FILL.
- B. Initial backfill over all pipe shall be clean, fine granular material.
- C. Backfill trenches via mechanical means or by hand methods. Loose soil shall be placed in the trench in lifts of 6-inches and compacted by tamping after each lift is placed. The top 6-inches of backfill in planting areas shall be accepted imported screened soil. Should any settling of the soil over trenches occur after completion of the irrigation system, the Contractor shall refill and compact the soil as directed at no additional cost to the Owner.
- D. Backfill only when pipe is cool. During hot weather, pipe can be cooled by operating the system for a short time prior to backfilling.
- E. Provide marking tape, as specified in Section 02500 – UTILITY SERVICES, over all pressure supply main lines.
- F. Properly compact backfill in trenches to dry density equal to the adjacent undisturbed soil, and conform to adjacent grades without dips, sunken areas, humps, or other irregularities.
- G. Restore grades and repair any damage where settlement may occur.

3.07 PLASTIC PIPE AND FITTINGS

- A. Install and connect plastic pipe in accord with manufacturer's recommendations.
- B. Install groups of pipes parallel to each other, spaced to permit valve servicing.
- C. Install fittings for changes in direction and branch connections.
- D. Install flanges adjacent to valves and to final connections to other components with 2-1/2 inches or larger pipe connection.
- E. Install underground piping according to ASTM D2774 and ASTM F690.
- F. Prepare all welded joints with approved cleaner prior to applying primer and solvent.
 1. Allow welded joints at least 15-minute set-up and curing time before moving or handling.
 2. Partially center load pipe in trenches to prevent movement or shifting when water pressure is applied.

February 27, 2026

3. Do not permit water in pipe for a minimum of 4 hours after applying solvent welds.
 4. When the temperature is above 80 degrees Fahrenheit, allow solvent weld joints at least 24 hours curing time before water is introduced under pressure.
 5. Suspend all solvent welding if air temperature falls below 40 degrees Fahrenheit. Pipe and fittings installed at temperatures below 40 degrees Fahrenheit shall be removed and replaced at no cost to Owner.
- G. Installing pipe under existing pavement:
1. Piping under existing pavement may be installed by jacking, boring, or hydraulic driving. Hydraulic driving will not be permitted under asphalt paving.
 2. Secure permission from Architect prior to cutting or breaking any existing pavement. Repairs or replacement to existing paving shall be approved and completed to the satisfaction of the Architect and shall be installed at no additional cost.
- H. Install transition fittings for plastic-to-metal pipe connections according to the following:
1. Underground Piping:
 - a. 1-1/2 inches and Smaller: Plastic-to-metal transition fittings.
 - b. 2 inches and Larger: AWWA transition couplings.
 2. Aboveground Piping:
 - a. 2 inches and Smaller: Plastic-to-metal transition unions.
 - b. 2 inches and Larger: Use dielectric flange kits with one plastic flange.
- I. Install dielectric fittings for dissimilar-metal pipe connection according to the following:
1. Underground Piping:
 - a. 2 inches and Smaller: Dielectric coupling or dielectric nipple.
 - b. 2-1/2 inches and Larger: Prohibited except in control valve box.
 2. Aboveground Piping:
 - a. 2 inches and Smaller: Dielectric union.
 - b. 2-1/2 inches to 4 inches: Dielectric flange.
 - c. 5 inches and Larger: Dielectric flange kit.
 3. Piping in Control Valve Boxes:
 - a. 2 inches and Smaller: Dielectric union.
 - b. 2-1/2 inches to 4 inches: Dielectric flange.
 - c. 5 inches and Larger: Dielectric flange kit.
- J. Detectable Marking Tape: Install continuous identifying and detectable warning tape above all pressure and mainline piping. Install at depth recommended by the manufacturer to ensure detection by non-ferrous detector.

K. Flushing System:

1. After all sprinkler pipe and risers are in place, open control valve and thoroughly flush system clean prior to installing sprinkler heads.
2. Contractor shall be responsible for repair of clogged nozzles for a period of thirty days after notice of substantial completion.

3.08 JOINT CONSTRUCTION

- A. Ream ends of pipes and tubes and remove burrs. Bevel plan ends of steel pipe.
- B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- C. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
- D. Flanged Joints: Select rubber gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.
- E. Copper-Tubing Brazed Joints: Construct joints according to CDA's "Copper Tube Handbook," using copper-phosphorus brazing filler metal.
- F. Copper-Tubing Soldering Joints: Apply ASTM B813 water flushable flux to tube end unless otherwise indicated. Construct joints according to ASTM B828 or CDA's "Copper Tube Handbook," using lead-free solder alloy (0.20 percent maximum lead content) complying with ASTM B32.
- G. PE Piping Fastener Joints: Join with insert fittings and bands or fasteners according to piping manufacturer's written instruction.
- H. PVC Piping Solvent-Cemented Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
 1. Comply with ASTM F402 for safe-handling practice of cleaners, primers, and solvent cements.
 2. PVC Pressure Piping: Join schedule number, ASTM D1785, PVC pipe and PVC socket fittings according to ASTM D2672. Join other-than-schedule-number PVC pipe and socket fittings according to ASTM D2855.
 3. PVC Non-pressure Piping: Join according to ASTM D2855.

3.09 CONDUITS

- A. Install conduit where control wires pass through or under walks, walls and paving. Conduits shall be of adequate size to accommodate retrieval of wires for repair and shall extend 18 inches beyond edges of walls and pavement.
- B. Install continuous conduit for all flow sensor and communication cables.

February 27, 2026

3.10 SLEEVES

- A. Install sleeves for all pipes and conduits passing through or under walks, walls and paving as indicated on Drawings. Sleeving shall be of adequate size to accommodate retrieval of wiring or piping for repair and shall extend 18 inches beyond edges of paving or other construction.
- B. Field verify location, size and depth of existing sleeves where noted on the Drawings. Notify Architect of any discrepancies prior to the start of installation.

3.11 CONTROL WIRE

- A. Control wire shall be run in same trench adjacent to mainline pipe whenever possible. Multiple wires in run to be bundled and taped together at 12-foot intervals.
- B. Install control wire in PVC SCH. 40 gray conduit when not run with mainline.
- C. Use only continuous wire between controller and remote control valves. Do not use wire splices.
- D. Make underground wire connections to electric remote control valves with UL-listed 3M DBR/Y-6 connectors.
- E. An expansion curl shall be provided at each wire connection. Expansion curl shall be of sufficient length at each control valve, so that the valve bonnet may be brought to the surface for maintenance without disconnecting the wires.

3.12 VALVE ASSEMBLIES

- A. Install and connect all assemblies in accord with Drawings.
- B. Do not install multiple assemblies on individual service tees. Provide each assembly with its own outlet. When used, the pressure relief valve shall be the last assembly.
- C. All threaded fittings shall be assembled using Teflon tape applied to the male threads.
- D. When specified, install backflow assemblies in shrub areas at the minimum height required by local codes.
- E. Locations for all equipment, as indicated on Drawings, such as point of connection, field satellites and valves are approximate.
 - 1. Minor modifications to layout and location of equipment shall be provided at no additional costs to Owner.
 - 2. Stake out all equipment locations for Architect's review and obtain approval prior to installation. Failure to obtain Architect's approval prior to installation may require Contractor to relocate or re-work installation at no additional costs to Owner.
 - 3. System modifications shall be recorded and made part of the record drawings.

3.13 GATE VALVES

- A. Install in accord with Drawings.
- B. Check and tighten valve bonnet packing before backfill.

3.14 ELECTRIC CONTROL VALVES

- A. Install in accord with Drawings.
- B. Install at sufficient depth to provide not more than 6 inches and not less than 4 inches cover from top of valve to finish grade.
- C. Install valves in a plumb position with 24 inches minimum maintenance clearance from other equipment.
- D. Valves shall be located away from walkways and in locations as inconspicuous as possible.
- E. Electric control valves shall be connected to field satellites in numerical sequence as indicated on Drawings.

3.15 QUICK COUPLER VALVES

- A. Install in accord with Drawings.

3.16 CONTROLLERS

- A. Controller Assemblies:
 - 1. Secure the following services from the approved equipment supplier:
 - a. On-site meeting to review system operation and ensure that all personnel understand system installation techniques.
 - b. On-site technical assistance during installation period when requested by Contractor or Architect.
 - c. Testing of grounding system.
 - d. Hook-up of communication and sensor wires within assemblies.
 - e. Continuity and resistance tests on communication wires.
 - f. Address satellites and decoders.
 - g. Verify system flow range and calibrate pulse transmitter.
 - h. Test system components for proper operation.
 - i. Certification that equipment conforms to and is installed in accord with Drawings, Specifications, and manufacturers' recommendations.
- B. High voltage wiring for controller:
 - 1. 120V power connection to field satellites to be provided under Division 16 of Specifications.
 - 2. All electrical work shall conform to local codes, ordinances, and authorities having jurisdiction.
- C. Controller Interconnect Circuitry:
 - 1. Warranty tests shall be performed by the approved supplier on all electrical circuits. Provide Architect with written approval from the equipment supplier prior to start of maintenance period.
 - a. Wire loop resistance (continuity): Test each circuit for maximum loop resistance not to exceed manufacturer's written recommendations.

- b. Ground fault: Test each circuit with an ohm meter, after each interconnect circuit has been installed and connections have been made. Minimum ground resistance shall not exceed manufacturer's written recommendations. After test has been completed, remove splices and leave exposed in pull box for future access.
 - c. Record results of circuitry tests and submit to Architect prior to acceptance of work.
 - d. Functional test: Perform test to demonstrate each and every part of the system functions as specified and intended.
 - (1) The functional test for each new or modified electrical system shall consist of not less than 5 days of continuous, satisfactory operation. If unsatisfactory performance of the system develops, correct the condition and repeat test until 5 days of continuous satisfactory operation has been obtained.
 - (2) Functional tests and turn-on shall not be started on a Friday, or on a day preceding a legal holiday. Shutdown caused by factors beyond Contractor's control shall not constitute discontinuance of the functional test.
- D. Interconnect Conductors:
- 1. Irrigation interconnect conductors shall be pulled by hand, leave 2 feet of coiled slack at each field controller and at each pull box.
 - 2. Splices shall occur within controller enclosure, unless specifically authorized otherwise by Architect.
 - 3. Make splices with UL-listed 3M DBR/Y-6 connectors only. Splices shall be capable of satisfactory operation under continuous submersion in water.

3.17 AUTOMATIC IRRIGATION CONTROL SYSTEM INSTALLATION

- A. Equipment Mounting: Install irrigation controllers on internal stainless steel backboards in stainless steel controller enclosures.
- B. Free-Standing Pedestal Mount Enclosures:
 - 1. Construct reinforced concrete pad, ensuring all required electrical, control wire, grounding connections, conduits, and anchoring devices are in place prior to placing concrete.
 - 2. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 3. Install anchor bolts to elevations required for proper attachment to supported equipment.
- C. Install control cable in same trench as irrigation piping and at least 2-inches below or beside piping. Provide conductors of size not smaller than recommended by controller manufacturer. Install cable in separate sleeve under paved areas.

3.18 GROUNDING

- A. Multiple controller locations shall have separate grounding for each controller or group of controllers. Lightning protection grids shall be installed in an irrigated area.
- B. Install ground plates a minimum of 12 feet from the controller and connect via a permanent exothermic Cadweld connection to #6 solid, bare copper wire. Additional ground plates shall be spaced at 20 feet intervals. The copper wire is to be installed in as straight a line as possible, and where necessary to make a turn or bend, it shall be done in a sweeping curve with a minimum radius of 9 inches and a minimum included angle of 90 degrees. There shall be no splices in the bare copper wire.
- C. Grounding plates shall be installed horizontally at 36 inches below grade with 100 lbs. of 'Powerset'™ ground enhancement material spread evenly above and below each plate in accordance with manufacturer's directions.
- D. Install a minimum of 6 inches of 4 inches perforated polyethylene pipe over each plate and cap with a flat PVC drain grate for periodic inspection. Plates shall also be covered with a 4 inches grated cover as specified, set a minimum of 1 inch below grade, to facilitate drainage onto the plate. Cover shall be installed on a minimum of 36 inches of 4 inches ADS corrugated polyethylene, perforated drainage pipe.

3.19 SPRINKLER HEADS

- A. Install in a plumb position, perpendicular to finish grade, at intervals not to exceed maximum spacing indicated on drawings.
- B. Install heads 1/2-inch above finish grade along curbs, walks, paving, and similar areas.
- C. Lay out sprinkler heads and make all minor adjustments required due to differences between site conditions and Drawings. All such deviations in layout shall be within the intent of the original Drawings, and without additional cost to Owner. Routing and layout of all piping shall be approved by Architect prior to installation.
- D. After all permanent sprinkler pipe lines and risers are in place and prior to installation of sprinkler nozzles, open control valves and flush out the system with a full head of water.
- E. Install nozzles of the required size and pattern for the area of coverage. Install pressure compensating screens per manufacturer's recommendations.

3.20 DRIP EMITTERS

- A. Install emitters and/or self-piercing barb connectors in emitter tubing using proper emitter installation tool.
- B. Flush all emitter tubing and PVC lateral lines prior to installation of emitters. Refresh lines after installation of emitters.

3.21 TRENCH RESTORATION

- A. Where irrigation systems are laid in existing lawns, the trenches, upon being properly backfilled and settled, shall be filled with approved existing onsite soil or imported screened soil to a depth of 4 inches, fine graded, completely re-grassed by use of sod, unless otherwise noted on the Drawings. The re-grassed trenches shall be maintained by watering, weeding, and fertilizing for a period to match plant establishment requirement for the Project.

3.22 FINAL ADJUSTMENTS

- A. Adjust sprinkler heights and vertical alignment as required to maintain proper relationship to established grades and planting. Re-grade and replant around sprinkler heads as necessary.
- B. Fill-in all depressions that may arise from possible settlement over trenching or other excavations, with proper soil mix. Compact lightly, and replant as needed to maintain planting design.
- C. Adjust nozzles to provide optimum coverage with no overspray to hardscape or building walls.
- D. Replace nozzles where required to provide full and complete coverage.
- E. Adjust or relocate moisture sensing equipment, as required, for proper operation.
- F. Adjust irrigation schedule and run times to provide adequate water to maintain landscaping.

3.23 INSTRUCTIONS

- A. After the irrigation system has been completed, inspected, and approved, the Contractor shall arrange for the services of a qualified instructor to instruct the maintenance personnel in the operation and maintenance of the system.

END OF SECTION

SECTION 02900 – PLANTING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Labor, equipment, materials, plants, soil preparation, planting, and maintenance requirements for all landscaping work as indicated on Drawings.

1.02 RELATED SECTIONS

- A. Section 02300 - EARTHWORK
- B. Section 02360 –VEGETATION CONTROL
- C. Section 02810 – IRRIGATION SYSTEM

1.03 DEFINITIONS

- A. Injury; defined, without limitation, as any bruising, scarring, tearing, or breaking of roots, trunk, bark, branches or foliage which may lead to or result in permanent damage to plant health or significantly alter the desired aesthetics of the plant for which it was selected.
- B. Dead Tree; is a tree that has died or that has been damaged or stressed to an advanced state of decline and has been determined to be so by the Architect's Certified Arborist.
- C. Drip Line; defined as the outer most limits of the tree canopy.
- D. Certified Arborist; an individual with a current certification from the International Society of Arboriculture (ISA) or member of the American Society of Consulting Arborists trained and experienced in all aspects of proper tree care.

1.04 REFERENCES

- A. International Society of Arboriculture (ISA) "Guide for Plant Appraisal 8th Edition 1992," prepared by the Council of Tree and Landscape Appraisers (CTLA).
- B. Standardized Plant Names; as established by Hortus III.
- C. ANSI A 300 - American National Standards for Tree, Shrub, and Other Woody Plant Maintenance - Standard Practices: 1995.
- D. ANSI Z 60.1 - American Standards for Nursery Stock: 2004., as approved by the American Association of Nurseryman.
- E. Cabling, Bracing, and Guying Standards for Shade Trees, as published by the National Arborist Association (NAA), 174 Rt. 101, Bedford, NH 03102.

1.05 ALLOWANCES

- A. Allowances for plants are specified in Division 01.
 - 1. Perform planting work under quantity allowances and only as authorized. Authorize work includes work required by Drawings and the Specifications and work authorized in writing by Architect.

February 27, 2026

2. Notify Architect weekly of extent of work performed that is attributable to quantity allowances.
3. Perform work that exceeds quantity allowances only as authorized by Change Orders.

1.06 UNIT PRICES

- A. Work of this Section is affected by unit prices specified in Division 01.
- B. Unit prices apply to authorized work covered by quantity allowance.
- C. Unit prices apply to additions to and deletions from the Work as authorized by Change Orders.

1.07 QUALITY ASSURANCE

- A. In accord with Section 01440 - QUALITY ASSURANCE AND QUALITY CONTROL.
- B. Qualifications of workmen:
 1. Contractor to be licensed by the State of Hawaii and a member in good standing of the Landscape Industry Council of Hawaii (LICH).
 2. Contractor shall have a minimum of 5 years of documented experience with successful landscape installations similar to the size and scope of work for this project.
 3. Contractor shall maintain a competent supervisor or foreman on site who is fluent in English and satisfactory to the Architect. Supervisor shall not be changed, except with prior consent of the Architect. Supervisor shall be present on-site during all operations and specified work in progress.
 4. Provide at least one person who is a Certified Arborist, to direct and be present during all tree pruning operations.
- C. Tests and Inspections:
 1. Plant Material:
 - a. All plant material shall be received in a healthy condition, free from pests and disease. Plants delivered to Contractor that are found to be damaged, root bound, diseased or distressed shall be brought to the Architect's attention prior to accepting delivery.
 - b. Plants shall be subject to inspection and approval by the Architect at nursery, growing grounds and upon delivery to site, for conformity to Specifications. Such approval shall not impair the right of further inspection or rejection during progress of work.
 - c. Pre-selection and tagging of plant material by the Architect or Landscape Architect is to meet design intent only and does not constitute any guarantee by the Architect of the selected plants. Health and vigor of plant material shall remain the sole responsibility of Contractor.
 - d. The Architect reserves the right to have plant samples analyzed at any time to verify plant health and conformity to Specifications. Furnish samples upon request. Testing to be done by the Architect's designated laboratory.

- 1) Cost of testing plant samples will be responsibility of Contractor. Lab fees for testing found to be negative will be reimbursed by Change Order to the Contract.
 - 2) Rejected material shall be promptly removed and replaced at no cost to the Architect.
2. On-site Soils:
- a. Pre-Construction Testing: Preconstruction testing of existing on-site soil shall be performed on native soil not previously impacted by prior construction. Native soil boundaries are defined in "Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii" by United States Department of Agriculture, Soil Conservation Service, Issued August 1972.
 - b. After rough grading has been completed and prior to planting operations, on-site soils are to be tested for agronomic suitability, biological function, and chemical characteristics. Soils report shall include amending requirements in order for on-site disturbed soils to be restored to optimal biological function and chemical characteristics. Contractor shall make all adjustments to improve the soils' characteristics and comply with final soils analysis recommendations as directed by soils report.
 - c. In the event that soil amendment recommendations are substantially different than those described for base bid, adjustments will be made by Change Order to Contract as agreed upon by the Architect.
 - d. The Contractor shall engage the services of a qualified agricultural soils testing laboratory to perform soil testing services of all areas to be planted.
 - 1) Soils testing shall be performed by Crop Nutrient Solutions, Inc., Post Office Box 40, Waimanalo, Hawai'i, 96795; Phone: (808) 386-4120.
 - e. Laboratory services shall include the following:
 - 1) A minimum of six samples or one sample per every 5000 sq. ft. (whatever quantity is greater) of base soil after completion of rough grading in landscape areas as directed by the Architect.
 - 2) Chemical analysis and written report of each individual sample to cover the following:
 - a) Soil structure and percentage of organic matter.
 - b) pH, Salinity and Lime content
 - c) Mineral nutrients, including concentrations of nitrogen, phosphorus, potassium, calcium, magnesium, iron, manganese, zinc, copper, sulfur, and molybdenum.
 - d) Potential hazards to healthy plant growth such as high salinity, sodium chloride, boron, impaired soil structure, or drainage.
 - 3) Recommendations for types, quantities, and application schedule for organic materials, fertilizers, and other materials found necessary to amend base soil for optimum plant growth.
 - 4) Recommendations for backfill mix or mix as appropriate to be utilized in installation of all plants for the project.

- 5) Testing laboratory shall follow standards set forth in the USDA Agricultural Suitability Test in accord with Handbook-60 and in accord with the Methods of Soil Analysis by the Soil Science Society of America, Inc.
- f. Testing laboratory may be employed by the Architect to provide additional periodic sampling and testing of amended landscape planting areas to ensure compliance with recommendations.
3. Imported Soil Amendment Material:
 - a. The Contractor shall be responsible for submitting a soils analysis of the amended and restored soils at the end of the project for review and approval by the Architect in order to demonstrate that restored soils have optimum biological function and chemical characteristics and meet recommendations provided by soil analysis report. Types, quantities, and application schedule of required organic materials, fertilizers, and other amendments required to mitigate soil deficiencies identified in the soil analysis report shall be included for review by the Architect.
 - b. All proposed imported soil amendments for planting areas shall meet specified requirements and be pre-approved by the Architect based on soil test results.
 - c. Cost for soils tests for this purpose shall be paid by Contractor. Provide chemical analysis report, written recommendation, and intended source of imported soil amendments for each individual sample to the Architect.
 - d. In the event that the initial proposed imported soil amendment is found unsuitable, additional sources shall be found and tested at Contractor's expense.
4. Imported Screened Soil Material:
 - a. The Contractor shall be responsible for submitting a soils analysis of the imported screen soil material at the beginning of the project for review and approval by the Architect in order to demonstrate adherence to recommendations provided by soils report.
 - b. All proposed imported soils for planting areas shall meet specified requirements and be pre-approved by the Architect based on soil analysis results.
 - c. Cost for soils tests for this purpose shall be paid by Contractor. Provide chemical analysis report, written recommendation, and intended source of imported soil for each individual sample to the Architect.
 - d. In the event that the initial proposed import soil is found unsuitable, additional sources shall be found and tested at Contractor's expense.
5. Observation Schedule
 - a. Observation and inspection of the work will be made on an ongoing basis and at the following stages of the work. Provide Architect prior notification to of the following with the advanced times indicated:
 - 1) Pre-installation conference: 10 working days.
 - 2) Completion of finish grading and soil preparation: 10 working days.

February 27, 2026

- 3) Plant delivery to site: 10 working days.
- 4) Tree locations prior to excavation of pits: 10 working days.
- 5) Shrub layout prior to excavation pits: 10 working days.
- 6) Pre-mulch inspection: 10 working days.
- 7) Premaintenance: 10 working days.
- 8) Final walk-through: 10 working days.

1.08 SUBMITTALS

- A. In accord with Section 01300 – SUBMITTAL PROCEDURES
- B. Submit manufacturer's data sheets for all proposed products to be used in work. Indicate specific items and product numbers.
- C. Contractor shall furnish all plant material indicated on Drawings. Any and all substitutions due to unavailability shall be requested in writing prior to confirmation of ordering.
 1. Submit for Architect's approval within 30 days after award of contract and prior to any start of work:
 - a. Documentation listing all required plant material by size, source, and quantity. Sort list by construction zone sequence if applicable.
 - b. Weed control program. Include all product information and schedule of operations.
 - c. Proposed schedule and sequence of work plan for all planting operations, with start dates and completion dates for planting trees, shrubs and groundcover.
 - d. List of proposed equipment to be used for tree planting and plan for plant storage on-site.
 - e. Soil test results and schedule of recommended fertilizers and amendments to correct soil deficiencies. Schedule of fertilizers and amendments shall include applications rates for pre-planting, planting, and post planting operations.

1.09 EXISTING CONDITIONS

- A. Protect all existing plant material that is to remain within or directly adjacent to the work to be performed. This shall include installing and maintaining protective barriers and/or temporary fencing.
- B. Maintain foliage of existing plants free of dust and debris from all construction operations. Wash plants down daily with potable water if necessary. Ensure water pressure and water stream do not damage plant material nor cause erosion or runoff.
- C. Vehicles and equipment shall not be parked, serviced, or operated within the drip line of existing trees or within newly planted areas. Access to all planting areas shall be limited to the personnel required for landscape installation.

1.10 MOCK-UP

- A. Provide mock-up samples for all materials as shown on drawings. Construct with all materials, methods, and procedures intended to be used in the final Work, including temporary supports, welded wire mesh support structure, and wire support. Mock-up shall be constructed a minimum of three months prior to commencement of work and shall be protected from construction. Maintenance service shall be provided for 90 days. At the end of 90 days, provide samples for Architect to review.
- B. Supervisors and installers that construct and finish mock-up are to be the same workman that install finish Work.
- C. Approved mock-up will be used as basis for judging and approval of final installation.
- D. If initial mock-up is not approved by the Architect, prepare subsequent mock-up(s) or provide modifications to initial mock-up until approved.

1.11 WARRANTY

- A. Warranty all plant material, smaller than 15-gallon container size, to be in healthy and flourishing condition of active growth for a period of one (1) year from the date of Substantial Completion.
- B. Warranty all plant material, 15 gallon or larger, to be in healthy and flourishing condition of active growth for a period of one (1) year from the date of Substantial Completion.
- C. Promptly replace all plant material found dead, dying, or damaged during the warranty period.
- D. Replacement shall be with material of same variety, size, form and character. Final selection to be approved by the Architect.
- E. Replacement shall include cost of plant material, delivery, labor, equipment and materials required for installation.
- F. Specimen trees that require replacement shall be removed and replaced in a timely and expedient manner. Coordinate with the Architect for selection of replacement tree and timing of work.
- G. Contractor will not be held responsible for failures that are directly attributed to Acts-of-God, vandalism or proven negligent care by Owner. Acts of God do not include diseases, pests, or moisture extremes noted herein.
- H. Special Warranty:
 - 1. All plant materials furnished shall be warranted as to the species, hybrid, flower color and/or variety specified.
 - 2. If after acceptance of the project, any warranted plant material proves to be of a different species, hybrid, flower color and/or variety not initially determinable, replace that plant with a new plant of the originally specified species, hybrid, flower color and/or variety. The new plant shall be equal in size to that of the incorrect plant at the time of its removal. The new plant shall meet the quality standards, be subject to the warranty, and be installed according to the specifications.

February 27, 2026

3. There is no time limit to this warranty, although it does not include plants reverting to the general species. The Architect will determine the nonconformance of plant materials and notify the Owner in writing of the required replacement work. All materials and work shall be at the expense of the Owner.

1.12 PRODUCT HANDLING

- A. Procedures: In accord with Section 01660 – PRODUCT STORAGE AND HANDLING REQUIREMENTS.
- B. Delivery:
 1. Deliver fertilizers to site in original unopened packages and containers, bearing manufacturer's name, trademark, guaranteed chemical analysis and conformance to State Law. Deliver bulk materials to site with certificate that includes manufacturer name, trademark, guaranteed chemical analysis, conformance to State Law and quantity delivered.
 2. Furnish delivery receipts for all amendments to the Architect.
 3. Notify Architect seven (7) days in advance of plant material deliveries.
 4. Submit an itemized list of plants included in each delivery.
- C. Deliver all plants with legible identification labels.
 1. Label trees, bundles, or containers of like shrubs or ground cover plants.
 2. State correct botanical name and container size.
 3. Use durable waterproof labels with UV and water-resistant inks. Do not remove labels until so directed by the Architect.
 4. Protect plant material from damage during delivery. Plants loaded for delivery from nurseries should not be double stacked or vertically layered in any way to cause damage or stress.
 5. Inspect all plant material for injury, disease and insect infestation. Evaluate trees and shrubs for improper pruning. In the event such conditions are found, bring to the Architect's attention for direction and remedial action to be taken.
- D. Handling:
 1. Exercise care in handling, loading, unloading, and storing of plant material. Plants that have been damaged prior to or during installation shall be replaced at Contractor's expense.
 2. Provide equipment of suitable size and capacity to safely off-load, transport and plant all trees.
 3. The "choke" strapping method of lifting trees is strictly forbidden (except for single trunk palms); any trees hoisted in this manner will be rejected.
- E. Storage:
 1. Plant materials shall be maintained in a healthy growing condition. Protect plants from physical damage by construction operations as well as inclement weather conditions such as high winds, excessive heat or dust.

February 27, 2026

2. Plants stored on-site shall be spaced to allow clearance for light and air and not be spaced tightly together such that limbs are crowded.
3. Maintain root balls with adequate moisture at all times.
4. Plants grown in shade conditions shall be stored and maintained in equivalent shade conditions.
5. Do not store plants directly on asphalt paving.

1.13 VERIFICATION OF DIMENSIONS AND QUANTITIES

- A. All scaled dimensions are approximate. Before proceeding with any work, carefully check and verify all dimensions and quantities. Immediately inform Architect of all discrepancies between Drawings, Specifications, and actual conditions. Do not do work in any area where there is a discrepancy until approval to proceed has been given by the Architect.

1.14 REGULATORY REQUIREMENTS

- A. Provide for all inspections and permits required by federal, state, and local authorities for furnishing and transporting plant materials.
- B. Perform work in accord with all applicable laws, codes, and regulations including licensing and training requirements for pesticide and herbicide applications.

PART 2 - PRODUCTS

2.01 TOPSOIL

- A. Contractor shall provide imported screened soil as source of soil material or imported amendments for amendments to existing soil. Source and location to be approved by the Architect. Contractor to submit soils reports for Architect's approval.
- B. Soil shall meet the following requirements.
 1. General: Free of roots, clods, and stones larger than 1/2 inch in the greatest dimension, pockets of coarse sand, noxious weeds, sticks, brush, and other litter. It shall not be infested with nematodes or other undesirable disease organisms such as insects and plant pathogens. Soil shall be friable and have sufficient structure in order to give good tilth and aeration to the soil. Total pore space content on a volume/volume basis shall be at least 15% when moisture is present at field capacity. Soil shall have a field capacity of at least 15% by weight.
 2. Gradation: Soil shall be a sandy loam, or loam, and similar to the native site soil. The definition of soil texture shall be in accord with USDA classification scheme. Obtain Architect's approval prior to grading operations.

Class	Particle Size Range	Maximum Percentage	Minimum Percentage
Coarse Sand	0.5-2.0 mm	40%	0%
Clay	<0.05 mm	20%	10%
Silt	<0.05 mm	40%	10%
Gravel	2-13 mm	20%	0%
Rock	13-25 mm		10% volume
Organic		15%	0%

3. Permeability: Hydraulic conductivity rate shall be not less than 1 inch per hour or more than 20 inches per hour when tested in accord with USDA Handbook No. 60, Method 34b or other Owner-approved methods.
4. Acidity: Soil pH range measured in the saturation extract (USDA Handbook No. 60, Method 21a) shall be 6.0 to 7.9.
5. Salinity: Salinity range measured in the saturation extract (USDA Handbook No. 60, Method 3a) shall be 0.5 to 2.0 dS/m. If calcium ions and sulfate ions both exceed 20 milliequivalents per liter in the saturation extract, the max salinity shall be 4.0 dS/m.
6. Chloride: Maximum concentration of soluble chloride in the saturation extract (USDA Handbook No. 60, Method 3a) shall be 150 mg/l (parts per million).
7. Boron: Maximum concentration of soluble boron in the saturation extract (USDA Handbook No. 60, Method 3a) shall be 1 mg/l (parts per million).
8. Sodium Absorption Ratio (SAR): Maximum SAR shall be 6 measured in accord with USDA Handbook No. 60, Method 20b.
9. Organic Matter Content: Sufficient soil organic matter shall be present to impart good physical soil properties, but not be excessive to cause toxicity or cause excessive reduction in the volume of soil due to decomposition of organic matter. Soils shall have a minimum 5% Organic Matter as Humus content, utilizing Walkley-Black soil testing method.
10. Heavy metals: Maximum permissible elemental concentration in soil shall not exceed the following:

Metal	Parts per million (mg/kg)¹
Arsenic	3
Cadmium	2
Chromium	10
Cobalt	2
Lead	30
Mercury	1
Nickel	5
Selenium	3

Metal	Parts per million (mg/kg)¹
Silver	0.5
Vanadium	3

¹ Ammonium Bicarbonate/DTPA Extractable, dry weight basis.

11. Fertility - Range of essential elemental concentration in soil shall be as follows:

Element	Low¹	High¹
Phosphorus	2	40
Potassium	40	220
Iron	2	35
Manganese	0.3	6
Zinc	0.6	8
Copper	0.1	5
Boron	0.2	1
Magnesium	50	150
Sodium	0	100
Sulfur	25	500
Molybdenum	0.1	30

¹ Ammonium Bicarbonate/DTPA Extractable, parts per million (mg/kilogram), dry weight basis.

- 1) If soil pH is between 6 and 7, maximum permissible elemental concentration shall be reduced 50%. If soil pH is less than 6.0, maximum permissible elemental concentration -12. Phytotoxic constituent, herbicides, hydrocarbons, and similar materials: Germination and growth of plant shall not be restricted more than 10% compared to standard controls. Standard controls shall be both monocots and dicots. Total petroleum hydrocarbons shall not exceed 100 mg/kg dry soil measured in accord with modified EPA Method No. 8015. Total aromatic volatile organic hydrocarbons (benzene, toluene, zylene, and ethylbenzene) shall not exceed 2 mg/kg dry soil measured in accord with EPA Method No. 8020.

12. Red Humic latasol soils, or types known as “Palolo Clay” or “Lualualei Clay” or similar materials shall not be accepted.

13. Screened to pass through 1/2-nch screen.

- C. Contractor responsible for providing imported screened soil over all planting areas. Refer to Drawings for locations of various soil depths.

February 27, 2026

- D. Backfill Mix for Trees and Shrubs and Groundcovers: Mix thoroughly prior to placing:
 - 60% screened soil
 - 25% 3/8 inch minus black cinder
 - 15% "Menehune Magic"/organic composted soil amendment
 - 1 lb. Sustane Fertilizer per cubic yard of mix
- E. Backfill Mix for Palms: Mix thoroughly prior to placing:
 - 85% washed beach sand
 - 15% "Menehune Magic"/organic composted soil amendment
 - 2 lb. Sustane Fertilizer per cubic yard of mix

2.02 AMENDMENTS

- A. Organic Amendments:
 - 1. Types of acceptable products are composts low in salts and heavy metals, free from weed seeds, pathogens and other deleterious materials meeting U.S. Composting Council specifications.
 - 2. Composted wood products are conditionally acceptable (stable humus shall be present). Wood based products which are based on red wood or cedar are not acceptable.
 - 3. Sludge-based materials are not acceptable.
 - 4. The compost shall be aerobic without malodorous presence of decomposition products.
 - 5. Humus material with an ash content of not less than 8% and not more than 50%.
 - 6. The pH shall be between 6 and 7.5.
 - 7. Salt content shall be less than 10 milliohm/cm at 25 degrees Celsius (ECe less than 10) in a saturated paste extract. The maximum rate of application shall not exceed 15% by volume unless the salinity is lower than 10 milliohm/cm at 25 degrees Celsius.
 - 8. Boron content of the saturated extract shall be less than 1.0 parts per million.
 - 9. Silicon content (acid-insoluble ash) shall be less than 20%.
 - 10. Calcium carbonate shall not be present.
 - 11. Carbon: nitrogen ratio shall be less than 20:1.
 - 12. Approved organic amendments and suppliers include Ferto (6-4-2) or Gro-Power Plus (5-3-1) or Architect approved equal.

February 27, 2026

- B. Sand: Washed, No 16 granite.

Sieve No. (US Standard)	Percent Dry Weight Passing
10	100
16	65-100
20	0-20
35	0-5
40	0-2

- C. Perlite: Coarse or No. 2 perlite, free of weeds and impurities.
- D. Calcium Carbonate: Minimum 95% calcium carbonate, 100% passing a No. 60 sieve.
- E. Single Super Phosphate (0-20-0): Granular commercial grade, minimum 20% P205.
- F. Soil Conditioner: Menehune Magic by Hawaiian Earth Products, ph (808) 682-5895.

2.03 FERTILIZER

- A. Organic Fertilizer Tablets: N-P-K as recommended by soil analysis, uniform in composition, slow releasing, free-flowing and suitable for application with approved equipment, delivered to the site in unopened containers. Each fully labeled, conforming to the applicable fertilizer laws, and bearing the name or mark of the manufacturer. Sustane Enhanced with Sumicoat Controlled Release Fertilizer in Root Zone Feeder Pack, by Sustane, ph (507) 263-3003, www.sustane.com
- B. Organic fertilizer: N-P-K as recommended by soil analysis, uniform in composition, slow-release nitrogen, free-flowing and suitable for application with approved equipment, pathogen and weed free, no sewage, blood or meat products, delivered to the site in unopened packaging. Each fully labeled, conforming to the applicable fertilizer laws, and bearing the name or mark of the manufacturer; apply according to manufacturer's written instructions. Sustane Fertilizer, ph (507) 263-3003, www.sustane.com

2.04 HERBICIDE

- A. Pre-emergent Herbicide: Chipco Ronstar-G as manufactured by Bayer.
- B. Pre-planting Herbicide: Round-Up or equal
- C. Soil Fumigant: Basamid G® Granular Soil Fumigant as manufactured by Cetris USA, Ltd.

2.05 PLANT MATERIALS

- A. Nomenclature: Plant names listed on Drawings conform to "Standardized Plant Names" established by Gardens of Hawaii by movie C. Neal and/or Hortus III.

February 27, 2026

Except for changes covered therein, established criteria of horticulture nomenclature is followed.

- B. All plants shall meet or exceed American Standards for Nursery Stock, ANSI Z60.1 latest edition.
 - 1. Acceptable sources for native plants:
 - a. Hui Ku Maoli Ola (Native Hawaiian Plant Nursery), ph (808)-235-6165.
- C. Plants shall be symmetrical as is typical for their variety and species, in a condition of healthy and vigorous growth with healthy normal root systems well filling their containers, but not to the point of being rootbound. They shall be free from plant disease, insects or their eggs or soil borne pathogens.
- D. Height and spread of all plants shall be measured with branches in their normal position. Where specific dimensions of any plant material are omitted from Plant List, plants shall be as approved by the Architect.
- E. All liners, plugs, dug sprigs, and flatted material shall be fully rooted. Plants should not be pruned prior to delivery, except as authorized by the Architect.
- F. Balled and burlap plant material shall meet standards of American Standards for Nursery Stock. Burlap shall be 100% natural fiber. No leno will be accepted.
- G. Palm Trees: Palms shall have square shaped root balls cut a minimum of 30 inches from base of trunk face. Retain a minimum of six fronds on head of palm, or as directed by Architect.
- H. Caliper measurement shall be taken at a point on the trunk 6 inches above natural ground line for trees up to 4 inches in caliper, and at a point 12 inches above the natural ground for trees over 4 inches in caliper
- I. Grass Plug, species as shown on the Drawings:
 - 1. Shall be healthy, living, with well-developed roots, 3-1/2 inches to 4 inches in length, freshly separated plugs and free from weeds.
 - 2. The source is to be inspected and approved by the Architect.
 - a. For native grasses, acceptable sources:
 - 1) Hui Ku Maoli Ola (Native Hawaiian Plant Nursery), ph (808)-235-6165.
 - 3. Immediately following harvesting, the plugs shall be thoroughly watered then kept moist during storage and transportation until planted. No plugs shall be accepted which are not in a cool, moist, fresh condition.
 - 4. Plugs are to be delivered and planted on the same day they are harvested to assure optimum rooting. If, for any reason, it is impossible to plant them at once, plugs shall be placed in a cool shady place so air can get to them, and they should be kept moist.
- J. Grass Sod, species as shown on the Drawings:
 - 1. The turf shall be sufficiently dense so that no soil is visible when mowed to a 1-1/2 inch height.
 - 2. Purchased in fresh, mature state from local suppliers, delivered weed free containing no more than 1% undesirable grasses.

3. Growing media shall be friable and well-drained and shall not exceed 1/2 inch when cut. Standard size sections of turf grass shall be strong enough that they can be picked up and handled without damage
- K. Grass Stolons, species as shown on the Drawings:
1. Shall be healthy, living, well developed runners, 1-1/2 inches to 2-1/2 inches in length, freshly dug up sprigs and free from weeds.
 2. The source is to be inspected and approved by the Architect.
 3. Immediately following harvesting, the stolons shall be thoroughly watered then kept moist during storage and transportation until planted. No sprigs or stolons shall be accepted which are not in a cool, moist, fresh condition.
 4. Sprigs and/or stolons are to be delivered and planted on the same day they are harvested to assure optimum rooting. If, for any reason, it is impossible to plant them at once, stolons or sprigs shall be placed in a cool shady place so air can get to them, and they should be kept moist.
- L. Hydromulch: Mulch shall be (paper or virgin wood cellulose fiber mulch) specifically processed fiber containing no growth or germination inhibiting factors. It shall be such that after addition and agitation in the hydraulic equipment with seeds, fertilizer, water and other additives not detrimental to plant growth, the fibers will form a homogeneous slurry. The hydromulch equipment shall be capable of mixing all the necessary ingredients to a uniform mixture and to apply the slurry to provide uniform coverage. Fertilizer and mulch mix shall be applied in one operation by approved hydraulic equipment. The equipment shall have a built-in agitation system with an operating capacity sufficient to keep the mix in uniform distribution until pumped from the tank. Distribution and discharge lines shall be large enough to prevent stoppage and shall be equipped with hydraulic discharge spray nozzles, which provide a uniform distribution of the slurry.

2.06 MISCELLANEOUS MATERIALS

- A. Water: Furnished by Owner. Distribution and connections by Contractor.
- B. Tree Stakes: Lodgepole Pine wood stakes treated with wood preservative in strict compliance with state and federal regulations 2-inch diameter x length as required per Drawings.
- C. Staking Ties: Cinch Ties, 32 inch by V.I.T. Products, Inc., Tel: (760) 735-2450
- D. Tree Guys:
1. Type A: #12 ga galvanized iron wire for 15- and 25-gallon trees, #9 ga. Galvanized iron wire for field stock trees, up to 3-inch caliper, or Architect - approved equivalent. Hose shall be 1/2-inch diameter black rubber hose.
 2. Type B: Duckbill DTS Guy Kit, Model DTS-88 and Model DTS-138 for trees 10-inch caliper and larger by Forsight Products, Inc., www.earthanchor.com, Tel: (800) 325-5360.
 3. Type C: Duckbill DTS Guy Kit, Model RBA-88 and Model RBK-138 for rootball anchoring systems of palm trees. Forsight Products, Inc., www.earthanchor.com, Tel: (800) 325-5360.
- E. Rebar: #4 24 inch minimum length for trees 25 gallon and smaller. #7 36-inch minimum length for larger trees.

February 27, 2026

- F. Marker: Plastic surveyor tape. Bright color, minimum 18 inches length. Use same color throughout project.
- G. Aluminum Edging: Standard-profile extruded-aluminum edging - 1/8 inch thick by 5-1/2 inches deep, ASTM B221, Alloy 6063-T6, Black anodized, aluminum stakes – ASTM B221, Alloy 6061-T6 approximately 1-1/2 inches wide by 12 inches long. Provide from one of the following manufacturers:
 - 1. Permaloc Corporation, ph (616-399-9600)
 - 2. Sure-loc Edging Corporation
- H. Root Control Barriers: DeepRoot Tree Root Barriers, www.deepproot.com, ph (415) 781-9700.
- I. Filter Fabric: Style 307, as manufactured by Belton Industries, ph (800) 851-5049.
- J. Gravel: No. 3b fine blue rock, 3/4 inch minus.
- K. Black Cinder: 3/8 inch minus crushed black cinder.

PART 3 EXECUTION

3.01 SITE PREPARATION

- A. Weed Control:
 - 1. Before and during preliminary and finish grading, dig out all noxious or invasive weeds and grasses by roots and dispose of off-site. Any non-perennial type grasses, except for Torpedo and Nut Grass, less than 2-1/2 inches high and not bearing seeds, may be turned under. Prior to planting, eliminate any weeds present in delivered plant stock.
 - 2. Site shall be maintained weed-free throughout planting operations and until final acceptance. Prior to mulching, apply pre-emergent herbicide to all shrub and groundcover areas.
 - 3. Fumigate soil for all sodded or seeded planting areas with Basamid® G granular fumigant. Apply per manufacturer's directions.
- B. Soil Preparation (pre-tillage) for all planted areas on grade:
 - 1. All planting areas that are compacted 85% to 90% are to be cross-ripped to 12 inches depth. Areas with over 90% compaction shall be cross-ripped to 24 inches depth, and all unacceptable materials removed.
 - 2. In areas to receive import soil, scarify top of the existing soil to 4 inches minimum depth prior to backfilling.
 - 3. Soil for planting shall be free of rocks over 1/2 inch in diameter, and any foreign debris, refuse, plant roots, clods, weeds, sticks, solvents, petroleum products, concrete, plaster, or other deleterious, undesirable and unwanted materials. Such materials shall be removed, including all temporary road bases or pavement already in place.
 - 4. Soil shall be free of soil-borne diseases and capable of sustaining healthy plant life.

C. Landscape Erosion Control:

1. Provide and maintain temporary erosion control for all planting areas. This shall include, but not necessarily be limited to; installation of silt fences at top and bottom of slopes and at 10 foot intervals along the face. Do not block irrigation coverage with silt fences.
2. Provide sand bags, sod, and/or erosion control silt fence at drainage swales until planting is established and soil has been stabilized. See Section 02370 for additional requirements.
3. Repair all scars caused by erosion to original grades.

3.02 LAYOUT

- A. Confirm locations and depth of all underground utilities and obstructions. If underground construction or utility lines are encountered during excavation for planting, alternate locations may be selected by Architect.
- B. Preliminary layout for trees shall be accomplished with colored flags or wooden stakes, each indicating plant name and container size (or other Architect approved method). Shrub material shall be spotted and approved in place by Architect prior to planting.

3.03 FINISH GRADING

- A. Minor grading modifications may be required to establish final grades.
- B. Finish grading shall ensure proper drainage of site as indicated on Civil Engineering Drawings.
- C. Planting areas shall be graded such that final grades will be 2 inches below adjacent paving, sidewalks, headers and similar conditions unless otherwise indicated on Drawings.
- D. Surface drainage shall be away from building foundations at 1/4 inch per foot to aid in water runoff.
- E. Remove or redistribute excess soil before application of fertilizer. Make allowances when establishing finish grades for earth excavation from planting pits and mulch.
- F. Trenches: If sprinkler system has been installed after grading and fertilizing has been completed, re-till trench backfill and fertilize to depth specified for area, to conform to specified requirements.
- G. Eliminate all erosion scars after each erosion event and prior to commencing maintenance period, unless directed otherwise by Owner.

3.04 INSTALLATION

- A. General:
 1. Ensure that final grades to ± 0.10 feet have been established. Provide for inclusion of all amendments, settling, and other preparatory needs. Ensure that

finish grading of all planting areas is as indicated on Drawings and as directed by Architect. Ensure all drainage swales and flow lines have been established.

2. Do not commence any planting until completion of all soil import, soil amendment and grading operations have been completed and approved by Architect.
3. Do not commence shrub planting until the landscape irrigation system has been installed and approved for proper coverage. Trees may be planted in advance of final landscape irrigation system provided provisions for adequate interim watering have been made. Interim watering may include providing automatic drip irrigation to all trees. Refer to irrigation Drawings and Specifications for requirements.
4. Actual planting shall be performed only during periods of suitable weather and soil conditions and during daylight hours.
5. Only as many plants as can be planted and watered on that same day shall be distributed in a specific planting area.
6. Relative position of each tree and plant as shown on the Drawings is subject to Architect approval and shall, if necessary to achieve project design objectives, be relocated prior to planting at no additional cost to Owner. Verify exact layout and locations of all plants with Architect prior to planting.

B. Planting:

1. Excavate plant pit sizes as indicated on Drawings.
 - a. Auger drain holes in bottom of planting pits.
 - b. Excavation for planting shall include stripping and stacking of all acceptable topsoil encountered within areas to be excavated for trenches, tree pits, plant pits, and planting beds.
 - c. Excess soil generated from planting pits not used as backfill, water basins, or in establishing final grades shall be removed from site.
2. Handle each plant in such a manner as to not cause injury or damage during placement or planting. Any plants damaged as a result of Contractor's operations shall be rejected and replaced at Contractor's expense.
3. The "choke" strapping method of lifting trees is strictly forbidden (except for single trunk palms); any trees hoisted in this manner will be rejected.
4. Scarify root ball as needed and to cut any circular root systems. Properly cut off broken or frayed roots.
5. Center plants in pits or as directed by Architect.
6. Face plants with fullest growth facing forward or as directed by Architect.
7. Plant trees and shrubs to expose original container soil and set with root crown approx. 1 inch above finished grade. Backfilling will not be permitted around trunks.
8. All plants which settle deeper than their surrounding grade are to be carefully raised and replanted at correct elevation at no additional cost to Owner.
9. Set each plant plumb and hold rigidly in position until soil has been tamped firmly around rootball. All palm apical meristems shall be plumb. Fill pit with

prepared soil, progressively settling soil by water jetting and flooding to remove air pockets and voids.

10. Water thoroughly immediately following planting. Backfill all voids which develop with additional prepared planting soil to bring to finish grade

11. Box container removal:

- a. Remove bottom of wood boxes before planting. If it is not possible to remove box bottom because of size, soil type or condition of rootball, remove every other bottom board, or other method approved by Architect.
- b. Remove sides of box without damage to root ball after positioning plant and partially backfilling.

12. Ball and burlap removal: Remove burlap away from the crown of the tree or palm. Cut away as much of burlap as possible without injury to root ball. Remove wire basket to 18 inches below finish grade

C. Backfill:

1. Planting pits shall be backfilled with amended soil mix. Water jet to remove all air pockets.
2. In a suitable area "central mix" all backfill soil to achieve a uniform blend with amendments. The intent is to achieve a consistent well blended soil in one location and not amend soil adjacent to each planting pit. Clean-up unused excavated soil and dispose of off-site. Protect mix from water until it has been placed around plants.

D. Fertilizer Tablets:

1. Apply in accord with manufacturer's recommendations.
2. Initially set required number of tablets on the top of each root ball while plants are still in their containers to facilitate planting and verification by Architect.
3. Locate plant tablets 1/3 depth of root ball in accord with manufacturer's instructions.

E. Watering Basins:

1. Where no other temporary watering system is required, construct an earthen basin around each tree. Each basin shall be of a depth sufficient to hold at least 4 inches of water. Maintain water basins until removal is required for installation of shrubs or turf.
2. Monitor tree and shrub root balls for adequate moisture content. Deep water and/or flood water basins as needed to maintain proper soil moisture.

F. Tree Staking and Guying:

1. Staking and guying of all trees shall be completed immediately after planting. Provide new stakes and ties or guying cables and anchors as shown on Drawings.
2. Remove and dispose of all original nursery stakes and ties.

G. Pruning: shall be limited to the minimum amount necessary to remove injured branches and to shape tree for design intent as directed by Architect. This shall include, but not be limited to: lifting of branch structure, thinning of canopy, and

elimination of cross branching. Pruning is not to be done in nursery prior to delivery. Pruning paint shall not be used.

- H. Auger Holes: Provide 12 inch diameter augured drain holes at 15 feet o.c. in all planting areas and in each tree pit and as indicated on drawings. Triangular space auger holes in large areas. Backfill with amended planting soil. Required depth of drain holes is to be to free draining soil layer below planter or a maximum of 6 ft. below bottom of planting pit.
- I. Root Control Barriers: Prior to backfilling, install root control barriers around rootballs as required for specified trees shown on drawings. Connect panels to form a continuous barrier around root ball. Install per manufacturer's directions.
- J. Soil Preparation:

- 1. For sodded, sprigged, and ground cover areas (except slopes 2:1 or greater): After approximate finished grades have been established, uniformly apply required amendments and thoroughly cultivate by means of mechanical tilling into the top 6 inches of soil.
- 2. The following rates and quantities shall be used for basis of bid only. Specific recommendations will be made after rough grading operations are complete and soil samples have been tested. In the event conditions are substantially different than described, adjustment will be made by Change Order as agreed upon with the Architect.

Application rates given are per 1000 sq. ft.:

- a. Organic amendment: 2 cu. yd. (Humus material).
- b. Fertilizers: Single superphosphate (0-20-0) 6 lb.
- c. Potassium sulfate (0-0-50): 4 lb.
- d. Ureaformaldehyde (38-0-0): 1/2 lb.
- e. Polyacrylamide (PAM): 12 lb.

NOTE: If PAM is unavailable, increase organic amendment to 3 cu. yd. per 1000 sq. ft.

- 3. For soil preparation with PAM, broadcast the amendments and fertilizers as noted above. Apply PAM with a drop spreader. Use caution to avoid drift onto non-soil areas. PAM must be kept dry until it has been incorporated into the soil. Rototill amendments thoroughly into the soil 6 inches deep within 4 hours after application of PAM. Slightly dampened soils will need an immediate tillage after the PAM application. If the organic amendment is damp and is applied after the PAM, rake the PAM into the soil to the addition of the organic amendment or allow the amendment to dry prior to application of PAM. Irrigate the soil to allow water to penetrate to a depth of 6 inches. The soil needs to be damp but not saturated. Allow the soil to dry or at least dry to the point where the stringiness has disappeared, then re-rototill the soil 6 inches deep.

K. Sod Planting:

1. Preparing soil: Remove rocks, debris and perform weed abatement for area to be sodded. Rip soil to a depth of 6 inches and break up all clods to less than 1 inch in size. Soil prep as described elsewhere in Specifications.
2. Grading and rolling: Carefully smooth surface areas to be sodded. Roll areas to expose soil depressions or surface irregularities. Regrade as required to obtain optimum conditions.
3. Fertilizing: As noted in soil preparation. Verify turf fertilizer with Soils Report prior to purchasing.
4. Laying sod: Lay first strip of sod slabs along a straight line (use a string in irregular areas). Butt joints tightly, do not overlap edges. On second strip, stagger joints (much as in laying bricks). Use a sharp knife to cut sod to fit curves, edges, and sprinkler heads. Do not use sod strips less than 10 inches wide.
5. Watering: Do not lay entire lawn area before watering. When a conveniently large area has been sodded, water lightly to prevent drying out. Continue to lay sod, and to water, until installation has been completed.
6. Rolling sod: After laying of sod has been completed, lightly roll to eliminate irregularities and to form good contact between sod and soil. Avoid very heavy rollers or excessive initial watering to avoid roller marks.
7. Irrigation: Thoroughly water complete lawn surface. Soil should be moistened at least 2 inches deep. Repeat sprinkling at regular intervals to keep sod moist 2 inches deep at all times. After sod is established, decrease watering frequency and increase amount of water per application as needed. Do not allow water to pond. Avoid excessive watering. Soil shall be moist but not saturated. Monitor irrigation as required.
8. Replacement: Replace all dead or dying sod with equivalent quality material as directed by Architect.
9. Minimize pedestrian traffic over sodded areas during its growth establishment (90 days).

L. Hydromulch/Hydrosprigging

1. Areas to be hydro-sprigged shall be brought to a smooth even surface according to civil grading plans. Maintain previously established grades and swales.
2. After ground surfaces have been raked smooth and on an even plane, in accordance to specifications and upon approval by Architect, proper soil moisture must be obtained then broadcast stolons/seed uniformly at rates listed on the Drawings.
3. Determine the proper fertilizer required, for both planting and on-going maintenance, for the plant materials. Determine the quality, analysis and ratio; method of application; and frequency of the fertilizer, to insure sufficient nutrients for the sustained growth of the plant material.
4. Broadcast grass sprigs uniformly over prepared surface at a rate of 10 cu. Ft./1000 sq. ft. and mechanically force sprigs into lightly moistened soil.

5. On the same day and immediately following sprigging operations, indicated field areas are to be capped with wood fiber using conventional "Hydromulch" equipment as manufactured by the Bowie Machine Works, or approved equal. When hydraulically sprayed on the soil, the fibers shall form a blotter like ground cover, which readily absorbs water and allows infiltration to the underlying soil. In every application, complete coverage of the soil shall be attained. Mulch shall be applied at the minimum rate of 40 lb. per 1,000 sq. ft. (1700 lb. per acre) using water at the rate of 25 gallons per 1,000 sq. ft. (1,000 gallons per acre).
6. Hydromulching of turf areas shall consist of mixing the hydromulch slurry, pre-plant fertilizer product, and spraying the mixture over the newly installed grass sprigs and soil.

3.05 PLANT MAINTENANCE

- A. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring watering basins, adjusting and repairing tree-stabilization devices, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings.
- B. Fill in, as necessary, soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.
- C. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated pest management practices when possible to minimize use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.

3.06 CLEAN UP

- A. Pick up all trash resulting from this work no less frequently than the last working day of each week or as directed by Architect. All trash shall be removed completely from site. After planting operations have been completed, remove trash, excess soil, empty plant containers and rubbish from property. Scars, ruts, and other marks in ground caused by this work shall be repaired and the site left neat and orderly throughout.
- B. Leave site area broom-clean and wash down all paved areas within Contract area, leaving premises in a clean condition.

3.07 MAINTENANCE SERVICE

- A. Maintenance Service for Trees and Shrubs: Provide maintenance by skilled employees of Landscape Installer. Maintain as required in 3.05 PLANT MAINTENANCE. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established, but for not less than maintenance period below:
 1. Maintenance Period: Six months from date of acceptance of planting completion.
- B. Maintenance Service for Ground Cover and Other Plants: Provide maintenance by skilled employees of Landscape Installer. Maintain as required in 3.05 PLANT

February 27, 2026

MAINTENANCE. Begin maintenance immediately after plants area installed and continue until plantings are acceptably healthy and well established, but for not less than maintenance period below:

1. Maintenance Period: Six months from date of acceptance of planting completion.

3.08 FINAL ACCEPTANCE

- A. Maintain all planted areas free of debris and insects. Mow, cultivate, weed and water all areas until final acceptance of work is made by Architect. All punch list items shall be completed and all irrigation to be operational prior to Architect's acceptance of project installation.
- B. Prior to final approval of work:
 1. Re-sod or replant areas where necessary to obtain full and even coverage.
 2. Remove all debris resulting from work of this Section.
 3. Regrade, lightly compact, and replant around sprinkler heads where necessary to maintain proper vertical positioning in relation to established grade.
 4. Fill all depressions and eroded channels with sufficient soil mix to repair grade and ensure proper drainage. Compact lightly, and replant filled areas in accord with Drawing requirements.
- C. Final acceptance of work and approval by Architect for Substantial Completion shall include, but may not be limited to:
 1. Punch list items completed and approved by Architect.
 2. Final grades approved in accord with Drawings and Specifications.
 3. Site weed-free and in accord with approved weed control plan.
 4. Trees, shrubs, groundcovers, and mulches are all installed in accord with Drawings and Specifications.
 5. Landscape irrigation system is complete and fully operational.
- D. Architect will issue a Letter of Acceptance upon final completion and approval of all work.

END OF SECTION

SECTION 02906 – TREE TRANSPLANTING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Digging, boxing and moving of existing trees on site which have been designated for relocation as shown on Drawings.

1.02 RELATED SECTIONS

- A. Section 02810 – IRRIGATION SYSTEMS
- B. Section 02900 – PLANTING

1.03 REFERENCES

- A. International Society of Arboriculture (ISA) "Guide for Plant Appraisal 8th Edition 1992," prepared by the Council of Tree and Landscape Appraisers (CTLA).
- B. International Society of Arboriculture (ISA) "Best Management Practices for Tree Pruning,"
- C. "Cabling, Bracing and Guying Standards for Shade Trees", as published by the National Arborist Association (NAA), 174 TR 101, Bedford, New Hampshire, 03102.

1.04 DEFINITIONS

- A. Injury; defined, without limitation, as any bruising, scarring, tearing, or breaking of roots, trunk, bark, branches or foliage which may lead to or result in permanent damage to tree health. Injury may also result from excessive pruning and over-compaction of soil around root zone.
- B. Dead Tree; a tree that has died or that has been damaged or stressed to an advanced state of decline and has been determined to be so by the Architect's Certified Arborist.
- C. Drip Line; defined as the outer most limits of the tree canopy.
- D. Caliper; diameter of tree trunk at breast height (DBH) or 54" above finish grade.
- E. Certified Arborist; an individual with a current certification from the International Society of Arboriculture (ISA) or member of the American Society of Consulting Arborists trained and experienced in all aspects of proper tree care.

1.05 QUALITY ASSURANCE

- A. Contractor shall have a minimum of five years of documented experience performing successful tree transplanting operations similar to the size and scope of the work required for this contract.
- B. Maintain a supervisor or foreman on site who is fluent in English and satisfactory to Architect. Supervisor shall not be changed, except with prior consent of Architect. Supervisor to be present on-site during all operations of the work.

February 27, 2026

- C. Provide at least one person who is a Certified Arborist, to be present on site to oversee and direct all pruning, digging and handling operations.
- D. All pesticide applications to be made under direction of a Hawaii Licensed Pest Control Advisor.

1.06 SUBMITTALS

- A. In accord with Section 01300 – SUBMITTAL PROCEDURES.
- B. At least two weeks prior to commencement of the work, provide the following submittals for Architect's approval:
 - 1. Written evaluation of the existing condition of the trees to be moved.
 - 2. Detailed description of proposed sequence and schedule for the work.
 - 3. Detailed description of maintenance plan.
 - 4. List and description of proposed equipment to be used for digging and moving trees.
 - 5. Certification of Arborist employed by the contractor to oversee the work.

1.07 EXISTING CONDITIONS

- A. Identify and mark locations of all existing underground utilities prior to starting any excavation.
- B. Evaluate and document existing condition of trees under this contract.
- C. Coordinate and cooperate with other trades on site to enable the work to proceed as rapidly and efficiently as possible.

1.08 GUARANTEE

- A. Guarantee all trees, covered by the provisions of this Section, to be in healthy and flourishing condition of active growth for a period of one (1) year from the date of Substantial Completion.
- B. Trees that have died or have been damaged to a state that they have become a potential safety hazard or are no longer aesthetically acceptable, will be replaced at Contractor's expense.
- C. Trees that require replacement shall be removed and replaced in a timely and expedient manner. Replacement work shall not impede park operations and shall be performed and completed during non-operating park hours.
- D. Replacement shall be with material of same variety, size, form and character. Final selection to be approved by Architect.
- E. Replacement shall include costs of tree and all materials, labor, delivery and equipment required.
- F. Contractor will not be held responsible for failures that can be directly attributed to Acts-of-God, vandalism or proven negligent care by Architect.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Wood Boxing materials, metal strapping, and ball and burlap materials. All boxes shall be new and sound, fabricated of Douglas fir or Redwood.
- B. Provide all required moving materials such as straps, chain and cable in accord with current horticultural practices.
- C. Pruning sterilant; Physan 20® Fertilome Type A or diluted bleach solution.
- D. Anti-transpirant; Wilt-proof®, distributed by Better Flora, Tel; (800) 324-0705
- E. Fungicide; Subdue® Maxx, by Syngenta, Tel; (866) 796-4368
- F. Bonide 4-10-3 "Root-N-Grow" transplant fertilizer with IBA growth hormone.

PART 3 - EXECUTION

3.01 GENERAL

- A. Conduct operations on a continuous and uninterrupted schedule, weather permitting, from start to completion.
- B. Trees which require pruning to facilitate moving shall be inspected and evaluated by both the Architect and Contractor before starting this work.
 - 1. All pruning shall be directed and performed under the direct supervision of a Certified Arborist.
 - 2. All pruning shall be performed in accord with accepted horticultural practices and shall be approved by the Architect. Excessive pruning, which shall be considered as more than 25 percent of the functioning leaf and branch area, will not be permitted.

3.02 DIGGING AND BOXING PROCEDURES

- A. Preparation:
 - 1. Contractor shall spray all trees to be moved, prior to digging, with Wilt-proof®. Application shall be made following with manufacturer's directions.
 - 2. All trees to be relocated shall be root drenched with Subdue®. Application shall be made following with manufacturer's directions.
 - 3. Excavate and prepare planting pits at new locations for relocated trees in accord with requirements of Section 02900 – PLANTING.
 - 4. Adjust existing irrigation system as necessary to accommodate relocated tree at new location and maintain complete irrigation coverage of planter area.
- B. Digging:
 - 1. Approximately 48 hr. prior to cutting, an application of Vitamin B-1 shall be administered to the root ball of the tree. Root pruning shall begin immediately thereafter.

February 27, 2026

2. Moisture content of soil around trees roots shall be monitored so that soil does not break away during root pruning, but is not so dry that the tree will be damaged. Under no circumstances shall the rootball be allowed to completely dry out.
 3. All trees shall be hand-dug, Dig trees to the full box size. No machine digging within the proposed box size shall be permitted.
- C. Root pruning:
1. All trees being relocated to be initially root-pruned.
 2. All root pruning to be done by hand. Exposed ends of all roots shall be cut clean and square.
 3. All roots larger than 3/4 inch diameter which are severed during root pruning shall be treated with a root anti-desiccant to diminish transpiration.
- D. Boxing:
1. Required box sizes shall be as specified on the Drawings or as determined in the field by the certified arborist with Architect approval.
 2. Following the side-boxing operations, the trees shall be undercut and bottom-boxed. Unless otherwise approved in advance, trees shall not be layed over on their side to place bottom boards. Box sides shall be secured firmly around the root ball with metal strapping before placing the top and bottom boards.
 3. Top boards and /or braces are to be padded with carpet remnants where they come in contact with the trunk.
 4. Top of boxes shall be high enough to clear top of root balls by not less than 3 inches. Soil shall be placed against the sides of the box to contain water and to produce a well basin at the top of the root ball.
 5. Palm trees may be dug and moved 'bare root' and healed in soil as approved by Architect. Root balls are to be cut square and sized large enough to adequately support the tree when transplanted.

3.03 MOVING PROCEDURES

- A. Trees shall be lifted and transported in a manner that will not cause damage or injury to the tree root ball, trunk or head during relocation.
- B. Provide equipment of suitable size and sufficient capacity to safely lift, transport and place trees.
- C. The 'Choke' strapping method of lifting trees is strictly forbidden (except for single trunk palms).
- D. Place temporary guying, slings or support bracing as needed to permit relocation of trees without damage. Such supports shall be securely, but temporarily attached to the tree with sufficient carpet padding provided for protection of tree bark.
- E. All trees to be relocated shall ultimately be transplanted on the site. Unless prior arrangements have been agreed upon by Architect, trees are not to be stored on-site, but shall be relocated and planted in the intended locations as designated on the Drawings.

February 27, 2026

- F. Health and maintenance of the trees during the transplanting, storage and relocation period shall be the responsibility of Contractor. Any tree which is severely damaged due to Contractor's negligence or failure to provide adequate protection shall be replaced.
- G. Plant trees in new locations following planting requirements of Section 02900-PLANTING.
- H. Fertilizer: Upon completion of planting and construction of water basins around newly planted trees, apply dilution of Bonide 4-10-3 Root-N-Grow fertilizer with growth hormone at the rate of 2 oz. dissolved in a two gallon bucket of water and poured on top of the root ball. Immediately after application, flood the basin with water and allow to dissipate in the soil. Repeat application twice.

3.04 REPAIRS

- A. A certified arborist shall make repairs to correct any minor damage sustained by relocation operations. Repairs shall be made promptly after damage occurs to prevent progressive deterioration. Repairs shall include removal of rough edges and sprung bark and injured or broken branches.

3.05 STORAGE

- A. If boxed trees are to be stored for a duration longer than 72 hours prior to being planted, they are to be maintained in a designated holding area and properly cared for by the contractor.
 - 1. Coordinate storage location with Architect. Storage area to be of sufficient size to accommodate trees without crowding branches and have suitable access for required relocation equipment.
 - 2. Provide temporary irrigation to all trees.
 - a. System to be low volume drip irrigation that includes all required tubing, emitters, valves, back flow preventer, filter and battery operated controller.
 - b. Point of connection to be made by contractor to an existing source of potable water. Coordinate and verify location with Architect.

3.06 MAINTENANCE

- A. Maintenance of the trees shall comply with standard horticultural practice for the correct watering, fertilizing, pruning, and spraying of specimen boxed trees.
- B. Maintain the transplanted trees free from weeds, pests and debris at all times.
- C. Perform periodic inspections of existing trees to be preserved and submit written proposal to the Architect for additional maintenance work that may be required to ensure the health and general well-being of the trees. Upon Architect's approval, retain any additional specialists as may be required to perform this work.

END OF SECTION

SECTION 03300 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mix design, placement procedures, and finishes.

1.02 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume.

1.03 SUBMITTALS

- A. Submit under the provisions of Section 01330 – SUBMITTAL PROCEDURES.
- B. Product Data: Reinforcing steel - Certified mill test results or laboratory test results. Indicate bar size, yield strength, ultimate tensile strength, elongation and bend test. Provide chemical composition for rebars that are to be welded.
- C. Design Mixes: For each concrete mix. Include alternate mix designs when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments. Indicate amounts of mix water to be withheld for later addition at Project site.
- D. Steel Reinforcement Shop Drawings: Details of fabrication, bending, and placement, prepared according to ACI 315, "Details and Detailing of Concrete Reinforcement". Include material, grade, bar schedules, stirrup spacing, bent bar diagrams, arrangement, and supports of concrete reinforcement. Include special reinforcement required for openings through concrete structures.
- E. Welding Certificates: Copies of certificates for welding procedures and personnel if welding is required.
- F. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance with the requirements indicated, based on comprehensive testing of current materials.
- G. Material Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:
 - 1. Form materials and form-release agents.
 - 2. Steel reinforcement and reinforcement accessories.
 - 3. Curing materials.
 - 4. Floor and slab treatments.
 - 5. Bonding agents.
 - 6. Adhesives.
 - 7. Vapor barriers.
 - 8. Epoxy joint filler.

February 27, 2026

9. Joint-filler strips.
10. Repair materials.
- H. Formliner Shop Drawing: Indicate formliner layout and termination details. Include jointing, form tie location, and pattern placement.
- I. Warranty: Submit warranty as noted under items entitled "WARRANTY" and "DRYING CONCRETE SLABS TO LIMIT MOISTURE VAPOR EMISSIONS AND ALKALINITY" hereinbelow.

1.04 QUALITY ASSURANCE

- A. Professional Engineer Qualifications: A Professional Engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for formwork and shoring and reshoring installations that are similar to those indicated for this Project in material, design, and extent.
- B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products complying with ASTM C94/C94M requirements for production facilities and equipment.
- C. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C1077 and ASTM E329 to conduct the testing indicated. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
- D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, each aggregate from one source, and each admixture from the same manufacturer.
- E. Welding: Qualify procedures and personnel according to AWS D1.4, "Structural Welding Code--Reinforcing Steel", if welding is required.
- F. ACI Publications: Comply with the following, unless more stringent provisions are indicated and maintain a copy at the field office.
 1. ACI 301, "Specification for Structural Concrete".
 2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials".
 3. ACI 347R "Guide to Formwork for Concrete".

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle steel reinforcement to prevent bending and damage.

1.06 WARRANTY

- A. Manufacturer's Warranty for Floor Vapor Emission Control System: Warrant against bond failure with concrete and failure of the system due to vapor emission and alkalinity levels for 5 years. The warranty period shall commence from the project acceptance date.

1. Warranty Provisions: The warranty provisions and number of years for the warranties required in this Section shall take precedence over the standard provisions in the Interim General Conditions (IGC).
- B. Manufacturer's Extended Warranty for Floor Vapor Emission Control System:
 1. Replace original finished flooring materials and vapor emission control system due to failure of the vapor emission control system to control vapor emission and prevent unacceptable alkalinity levels.
 2. Provide extended warranty that is covered by a separate material and installation bond or by the manufacturer's product liability insurance policy specifically covering the work on this Project. Contracting Officer shall have final approval of accepting the bond or manufacturer's insurance policy.

PART 2 - PRODUCTS

2.01 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Comply with ACI 347R. Provide new or good finish form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
 1. Plywood, metal, or other ACI 347R approved panel materials.
 2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
 - a. High-density overlay, Class 1, or better.
 - b. Medium-density overlay, Class 1, or better, mill-release agent treated and edge sealed.
 - c. Structural 1, B-B, or better, mill oiled and edge sealed.
 - d. B-B (Concrete Form), Class 1, or better, mill oiled and edge sealed.
- B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved
- C. material. Provide lumber dressed on at least 2 edges and one side for tight fit.
- D. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4-inch, minimum.
- E. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces. Form oils or waxes shall not be used for concrete surfaces intended to be painted. Formulate form-release agent with rust inhibitor for steel form-facing materials.
- F. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
 1. Furnish units that will leave no corrodible metal closer than one-inch to the plane of the exposed concrete surface.
 2. Furnish ties that, when removed, will leave holes not larger than 1-1/2 inches in diameter in concrete surface.

February 27, 2026

3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

2.02 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A615/A615M, Grade 60, deformed, unless otherwise noted on the drawings. All reinforcing bars to be welded shall comply with ASTM A706/A706M, Grade 60, deformed.
- B. Welded Wire Reinforcement: ASTM A1060/A1060M, galvanized. Provide welded wire reinforcement in sheets.

2.03 REINFORCEMENT ACCESSORIES

- A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place that will not puncture the vapor barrier. Use plastic straps or brightly colored tie wires to secure reinforcing. Manufacture bar supports according to CRSI's "Manual of Standard Practice" galvanized from steel wire, plastic, or precast concrete, and as follows:
 1. For concrete surfaces exposed to view and where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected. Refer to item entitled "STEEL REINFORCEMENT" hereinbelow for chair support spacing.
 2. For reinforcing supports against earth or vapor barrier, use precast concrete supports that have a surface area not less than 4 square inches and have a compressive strength equal to or greater than specified compressive strength of concrete being placed.
- B. Round Dowel Bars at Slab-on-Grade Joints: Hot-dipped galvanized ASTM A36/A36M rods. Galvanize in accordance to ASTM A123/A123M. Factory fabricated dowel baskets (galvanized) shall be used to align and support dowels.
- C. Zinc Repair Material: ASTM A780/A780M, zinc-based solder, electroplated zinc, paint containing zinc dust, or sprayed zinc.
- D. Tapered Plate Dowels: Galvanized plates, ASTM A36/A36M or ASTM A108.

2.04 CONCRETE MATERIALS

- A. Portland Cement: ASTM C150/C150M, Type 1.
- B. Pozzolans:
 1. Fly Ash: ASTM C618, Class C or F.
 2. Ground Granulated Blast-Furnace Slag: ASTM C989/C989M, Grade 100 or 120.
- C. Normal-Weight Aggregate: ASTM C33/C33M, uniformly graded, and as follows:
 1. Class: Moderate weathering region, but not less than 3M.
 2. Aggregate Size: 1-1/2 inches.
 3. Aggregate Size: No. 57 (one-inch to No. 4).
 4. Aggregate Size: No. 67 (3/4-inch to No. 4).

- D. Size of Coarse Aggregate: Except when otherwise specified or permitted, maximum size of coarse aggregate shall not exceed three-fourths of the minimum clear spacing between reinforcing bars (or bundled bars), one-fifth of the narrowest dimension between the sides of forms, or one-third of the thickness of slabs or toppings.
- E. Water: Mixing water for concrete shall be potable, non-potable or a blend of potable and non-potable water.
 - 1. Potable water may be used without testing for conformance to ASTM C1602/C1602M.
 - 2. Non-potable water or a blend of potable and non-potable water shall be tested for conformance to ASTM C1602/C1602M.
 - 3. Use only potable water for site-produced concrete.

2.05 ADMIXTURES

- A. General: Admixtures certified by manufacturer to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material and to be compatible with other admixtures and cementitious materials. Do not use admixtures containing calcium chloride.
- B. Air-Entraining Admixture: ASTM C260/C260M.
- C. Water-Reducing Admixture: ASTM C494/C494M, Type A.
- D. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
- E. Water-Reducing and Accelerating Admixture: ASTM C494/C494M, Type E.
- F. Water-Reducing and Retarding Admixture: ASTM C494/C494M, Type D.
- G. Crystalline Integral Waterproofing Admixture: Commercially formulated, chemical admixture capable of initiating and promoting growth of long, narrow crystal structures sufficient to fill and block capillary pores and micro-cracks within the concrete in order to prevent the passage of water.

2.06 VAPOR BARRIERS

- A. Vapor Barrier: ASTM E1745, Class A except as modified in subparagraph entitled "Permeance Rating" below, nylon- or polyester-cord-reinforced 3-ply high-density polyethylene sheet or one-ply extruded polyolefin sheet; 15 mil minimum thickness. Compliance to ASTM standards shall be confirmed by an independent testing agency.
 - 1. Permeance Rating: ASTM E96/E96M, ASTM E154/E154M not exceeding 0.01 gr/ft²/hr.

2.07 FLOOR AND SLAB TREATMENTS

- A. Slip-Resistive Aggregate Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive aggregate of silicon carbide, or fused aluminum-oxide granules or crushed emery with emery aggregate containing not less than 50 percent aluminum oxide and not less than 25 percent ferric oxide; unaffected by moisture, and cleaning materials.

February 27, 2026

- B. Penetrating Liquid Floor Treatment: Chemically reactive, waterborne solutions of inorganic silicate or silicate or polymerized polyester polymer or other materials and proprietary components; odorless; colorless; that penetrates, hardens, waterproofs or densifies concrete surfaces.

2.08 CURING MATERIALS AND EVAPORATION RETARDERS

- A. Moisture-Retaining Cover: ASTM C171, polyethylene film or white burlap-polyethylene sheet.
- B. Water: Potable.
- C. Clear, Solvent-Borne, Membrane-Forming Curing Compound: ASTM C309, Type 1, Class B.
- D. Clear, Solvent-Borne, Membrane-Forming Curing and Sealing Compound: ASTM C1315, Type 1, Class A.
- E. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C1315, Type 1, Class A.

2.09 RELATED MATERIALS

- A. Joint-Filler Strips: ASTM D1751, asphalt-saturated cellulosic fiber.
- B. Epoxy Joint Filler: 2-component, semi-rigid, 100 percent solids, epoxy resin with a Shore A hardness of 80 per ASTM D2240.
- C. Bonding Agent: ASTM C1059/C1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.
- D. Epoxy-Bonding Adhesive: ASTM C881/C881M, 2-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class and grade to suit requirements, and as follows:
 - 1. Type II, non-load bearing, for bonding freshly mixed concrete to hardened concrete.
 - 2. Types I and II, non-load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
 - 3. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
- E. Cementitious Coatings: Cement based polymer modified concrete finishing materials.
- F. Sleeves:
 - 1. Schedule 40 steel pipe, galvanized per ASTM A53/A53M. Cut ends of galvanized pipe shall be ground smooth of burrs and cut ends shall be galvanized following ASTM A780/A780M.
 - 2. Schedule 40 PVC Pipe.
- G. Reglets: Fabricate reglets of not less than (0.0217-inch) thick galvanized steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.

- H. Dovetail Anchor Slots: Hot-dip galvanized steel sheet, not less than 0.0336-inch thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.

2.10 REPAIR MATERIALS

- A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8-inch and that can be feathered at edges to match adjacent floor elevations. Products shall contain no added gypsum.
 - 1. Cement Binder: ASTM C150/C150M, Portland cement or hydraulic or blended hydraulic cement as defined in ASTM C219.
 - 2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
 - 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4-inch or coarse sand as recommended by underlayment manufacturer.
 - 4. Compressive Strength: Not less than 4,000 psi at 28 days when tested according to ASTM C109/C109M.
- B. Repair Topping: Traffic-bearing, cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4-inch. Products shall contain no added gypsum.
 - 1. Cement Binder: ASTM C150/C150M, Portland cement or hydraulic or blended hydraulic cement as defined in ASTM C219.
 - 2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
 - 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4-inch or coarse sand as recommended by topping manufacturer.
 - 4. Compressive Strength: Not less than 5,500 psi at 28 days when tested according to ASTM C109/C 109M.

2.11 CONCRETE MIXTURES

- A. Prepare mixture proportions for each type and strength of concrete determined by either laboratory trial mix or field test data bases, as follows:
 - 1. Proportion normal-weight concrete according to ACI 211.1 and ACI 301.
- B. Footings: Proportion normal-weight concrete mixture as follows:
 - 1. Minimum Compressive Strength: 4,000 psi at 28 days.
 - 2. Maximum Water-Cement Ratio: 0.50. Maximum water-cement ratio includes maximum 2 gallons water per cubic yard added in the field.
 - 3. Slump Limit: 6-inches.
- C. Slabs-on-Grades and Equipment Pads on Grade: Proportion normal-weight concrete mixture as follows:
 - 1. Minimum Compressive Strength: 4,500 psi at 28 days.
 - 2. Maximum Water-Cement Ratio: 0.45. Maximum water-cement ratio includes maximum 2 gallons water per cubic yard added in the field.

February 27, 2026

3. Slump Limit: 6-inches.
- D. Walls, Beams, Columns, and Other Miscellaneous Elements Shown on Structural Plans: Proportion normal-weight concrete mixture as follows:
1. Minimum Compressive Strength: 4,000 psi at 28 days.
 2. Maximum Water-Cement Ratio: 0.50. Maximum water-cement ratio includes maximum 2 gallons water per cubic yard added in the field.
 3. Slump Limit: 6-inches.
- E. Slab Vapor Emissions Rates: At the time of finished flooring installation, vapor emissions shall not exceed a maximum of 5 pounds per 1,000 square feet per 24 hours or the maximum emission established by the flooring manufacturer whichever is less. If the vapor emission rate exceeds the limit specified, take measures specified in item entitled "DRYING CONCRETE SLABS TO LIMIT MOISTURE VAPOR EMISSIONS AND ALKALINITY" hereinbelow to reduce the emissions to an acceptable level without delaying the project.
- F. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than Portland cement in concrete as follows:
1. Fly Ash: 25 percent.
 2. Combined Fly Ash and Pozzolan: 25 percent.
 3. Ground Granulated Blast-Furnace Slag: 50 percent.
 4. Combined Fly Ash or Pozzolan and Ground Granulated Blast-Furnace Slag: 50 percent Portland cement minimum, with fly ash or pozzolan not exceeding 25 percent.
- G. Do not add air entrainment to concrete of trowel-finished interior floors. Do not allow entrapped air content to exceed 3 percent.
- H. Limit water-soluble, chloride-ion content in hardened concrete per ACI 318 Chapter 4 for corrosion protection of reinforcing steel.
- I. Admixtures: Use admixtures according to manufacturer's written instructions.
1. Use water-reducing admixture or high-range water-reducing admixture (superplasticizer) in concrete, as required, for placement and workability.
 2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
 3. Use water-reducing admixture in pumped concrete, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.
 4. Use crystalline integral concrete waterproofing admixture in all walls and beams exposed to the exterior; exterior walls, retaining walls, planter walls, interior slabs-on-grade, and slabs-on-grade containing reinforcement. Dosage of the waterproofing admixture shall be at 2 percent by mass of all cementitious content of up to a maximum of 13.5 pounds per cubic yard of concrete.

2.12 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice".
- B. Any steel reinforcement to be welded shall follow the procedures of AWS 1.4/1.4M, "Structural Welding Code - Reinforcing Steel".

2.13 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C94/C94M, and ASTM C1116/C1116M and furnish batch ticket information. Batch ticket information shall include design mix reference, water that can be added at the jobsite, and admixtures. For transit mixing, complete not less than 70 revolutions of the drum at the manufacturer's rated mixing speed. Discharge concrete into its final position within 90 minutes after introduction of batch water to the cement. If a retarder admixture is used, the discharge time limit of 90 minutes may be increased by the time specified for retardation by the admixture manufacturer or the concrete supplier. Mix concrete a minimum of one minute at mixing speed immediately prior to discharge.
- B. Project-Site Mixing: Measure, batch, and mix concrete materials according to ASTM C94/C94M. Mix concrete materials in appropriate drum-type batch machine mixer.
 - 1. For mixer capacity of one cubic yard or less, continue mixing at least one and one-half minutes, but not more than 5 minutes after all ingredients are in mixer, before any part of batch is released.
 - 2. For mixer capacity larger than one cubic yard increase mixing time by 15 seconds for each additional one cubic yard.
 - 3. Provide batch ticket for each batch discharged and used in the work, indicating Project identification name and number, date, mix type, mix time, quantity, and amount of water added. Record approximate location of concrete placement in structure.
 - 4. Hand mixed concrete will not be allowed, except to make up shortages for fence post footing, thresholds, curbs and gutters, thrust block and utility trench encasements.

2.14 FIBER REINFORCEMENT

- A. Synthetic fiber shall be fibrillated or monofilament polypropylene fiber engineered and designed for use in concrete, complying to ASTM C1116/C1116M, Type III, 2-1/4 inches long. Dosage shall not be less than 5 pounds per cubic yard.

PART 3 - EXECUTION

3.01 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until concrete structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

- C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:
 - 1. Class A, 1/8-inch.
 - 2. Class B, 1/4-inch.
 - 3. Class C, 1/2-inch.
 - 4. Class D, one-inch.
- D. Construct forms to prevent loss of concrete mortar.
- E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to one vertical. Kerf wood inserts for forming keyways, reglets, recesses, and the like, for easy removal. Do not use rust-stained steel form- facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds. Maintain the integrity of the vapor barrier membrane.
- G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- H. Place 3/4-inch chamfer strips in corners of formwork to produce beveled edges on permanently exposed surfaces.
- I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the work. Determine sizes and locations from trades providing such items.
- J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.
- M. Formliners: Provide special forming materials to produce form surfaces with face design, texture, arrangement, and configuration as shown or noted on the Architectural Drawings.

3.02 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use Setting Drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 1. Install anchor bolts, accurately located, to elevations required with embedment required.

February 27, 2026

2. Install reglets to receive top edge of foundation sheet waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
 3. Install dovetail anchor slots in concrete structures as indicated.
 4. Install inserts, hangers, metal ties, nailing strips, blocking, grounds and other fastening devices needed for attachment of other work.
- B. Locate electrical or mechanical conduits and fittings so that the strength of the concrete member is not impaired. "Conduits" include pipes, ducts, and electrical conduits. Unless required otherwise on the drawings, conform to the following:
1. Concrete Walls:
 - a. Conduits larger than one-inch outside diameter shall not be embedded vertically in any wall. Conduits shall be spaced a minimum of 10 times outside diameter and shall be placed in the middle of the wall thickness.
 - b. No conduits shall be embedded horizontally in any wall, lengthwise.
 - c. Conduits passing through walls shall not impair the strength of the wall and shall be provided with Schedule 40 galvanized steel pipe (ASTM A53/A53M) sleeve.
 2. Concrete Beams:
 - a. Conduits larger than one-inch outside diameter shall not be embedded vertically in any beam. Conduits embedded vertically shall be spaced a minimum of 10 times outside diameter and shall be placed in the middle third of the beam thickness.
 - b. No conduits shall be embedded horizontally in any beam lengthwise.
 - c. Conduits passing through beams shall not impair the strength of the beam and shall be provided with Schedule 40 galvanized steel pipe (ASTM A53/A53M) sleeve.
 3. Concrete Slabs on Grade: Do not embed conduits within the thickness of any concrete slab on grade. Place conduits in the subgrade below the concrete slabs, but not within the thickness of the base course or gravel cushion, if any is required.
- C. Obtain Contracting Officer's approval to install conduit or pipe penetrations that may unduly impair the strength of the structural member (for example, vertical conduit embedded in a concrete column or multiple pipe penetrations near the face of a column).
- D. The Contractor shall coordinate the installation of all embedded items and penetrations. Cost of any added reinforcement required at pipe and conduit penetration and embedment shall be borne by the Contractor.

3.03 REMOVING AND REUSING FORMS

- A. General: Formwork, for sides of beams, walls, columns, and similar parts of the work, that does not support weight of concrete may be removed after cumulatively curing at not less than 50 degrees Fahrenheit for 24 hours after placing concrete provided concrete is hard enough to not be damaged by form- removal operations

- and provided curing and protection operations are maintained. The 24 hour period may be reduced to 12 hours in compliance with ACI 347R with prior approval from the Contracting Officer.
- B. Leave formwork and shoring in place to support construction loads and weight of concrete in structural members until in-place strength of concrete has reached its specified compressive strength at 28 days. Determine compressive strength of in-place concrete by testing representative field-cured test specimens according to ACI 301.
 - C. Clean and repair surfaces of forms to be reused in the work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for reuse at exposed surfaces. Apply new form-release agent.
 - D. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by the Contracting Officer.
 - E. Clean formliner before each use. Replace damaged formliner whose continued use of repair would negatively impact the aesthetics of the concrete finish.

3.04 SHORES AND RESHORES

- A. Comply with ACI 318, ACI 318M, ACI 301, and recommendations in ACI 347R for design, installation, and removal of shoring and reshoring.
- B. Plan sequence of removal of shores and reshore to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

3.05 VAPOR BARRIERS

- A. Vapor Barrier: Place, protect, and repair vapor-barrier sheets according to 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", and manufacturer's written instructions. The more stringent shall apply.
 - 1. Use the greatest widths and lengths practical to minimize lap joints. Seal laps joints and edges with tape or materials compatible with the vapor barrier. Remove and replace torn, punctured, or damaged vapor barrier materials, except when minor repairs or patches are allowed by manufacturer's instructions.
 - 2. Do not cut or puncture vapor barrier. No penetrations of the vapor barrier allowed except for permanent utilities. Seal all penetrations including pipes and reinforcing. Repair damage and reseal vapor barrier before placing concrete.
 - 3. Do not leave the vapor barrier exposed to sunlight for more than a few days prior to the concrete pour. Remove standing water from the vapor barrier prior to placing concrete.

3.06 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

February 27, 2026

- B. Clean reinforcement of loose rust and mill scale, earth, and other foreign materials.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
 - 1. Shop or field-weld reinforcement according to AWS D1.4, where indicated.
 - 2. Support slab reinforcing bars as follows:

BAR SIZE	MAXIMUM DISTANCE BETWEEN SUPPORTS
#3	2-feet
#4	3-feet
#5	4-feet
#3 at 15-inches each way	4-feet 6-inches on center each way

- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

3.07 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by the Contracting Officer.
 - 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
 - 2. Form from preformed galvanized steel, plastic keyway-section forms, or bulkhead forms with keys, unless otherwise indicated. Embed keys at least 1-1/2 inches into concrete.
 - 3. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
 - 4. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness, as follows:
 - 1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8-inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
 - 2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface. Complete sawing within 12 hours of concrete placement.

- D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
 - 1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.
 - 2. Terminate full-width joint-filler strips not less than 1/2-inch or more than one-inch below finished concrete surface where joint sealants, specified in SECTION 07920 - SEALANTS, are indicated.
 - 3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
- E. Dowel Joints: Install dowel sleeves, dowels, dowel bars, or plates, and support assemblies at joints where indicated. Use dowel sleeves or lubricate or asphalt-coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.08 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed. Provide notification to the Contracting Officer 2 days prior to the placement of concrete.
- B. Before placing concrete, water may be added at Project site, subject to limitations of ACI 301. Up to 2 gallons of water per cubic yard of concrete may be added at the jobsite provided the approved design mix accommodates the additional water. Do not add water to concrete after adding high-range water-reducing or plasticizing admixtures to mix.
- C. Convey concrete from mixer to the place of final deposit rapidly by methods that prevent segregation or loss of ingredients and will ensure the required quality of concrete. Use conveying equipment, conveyors, hoppers, baffles, chutes, pumps that are sized and designed to prevent cold joints from occurring and prevent segregation in discharged concrete. Clean conveying equipment before each placement.
- D. Deposit concrete continuously or in layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete to avoid segregation.
- E. Deposit concrete in forms in horizontal layers with proper consolidation into previous layers and in a manner to avoid inclined construction joints. Place each layer while preceding layer is still plastic, to avoid cold joints. For high wall pours (above 12-feet), Contractor must show its experience and demonstrate its proficiency before the Contracting Officer will permit pours in excess of 12-feet.
 - 1. Consolidate placed concrete with mechanical vibrating equipment. Use equipment and procedures for consolidating concrete recommended by ACI 309R.
 - 2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations no farther than the visible effectiveness of the vibrator. Place vibrators to rapidly penetrate placed layer

- and at least 6-inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete around reinforcement, embedded items, and into corners of forms to eliminate honeycombing or planes or weakness due to air voids and stone pockets.
3. Make construction joints only where located on drawings unless otherwise approved by the Contracting Officer. Plan pours to continuously place concrete from one construction joint to another.
- F. Deposit and consolidate concrete for slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 2. Maintain reinforcement in position on chairs during concrete placement.
 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
 4. Slope surfaces uniformly to drains where required.
 5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, free of humps or hollows, before excess moisture or bleed-water appears on the surface. Do not further disturb slab surfaces before starting finishing operations.
- G. Hot-Weather Placement: Place concrete according to recommendations in ACI 305R and as follows, when hot-weather conditions exist:
1. Cool ingredients before mixing to maintain concrete temperature below 95 degrees Fahrenheit at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
 3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.09 CONCRETE SLABS ON GRADE

- A. For interior areas, unless specified elsewhere, place concrete floor slabs directly over vapor barrier overlain atop granular fill-capillary barrier and reinforce slabs as indicated on plans.
1. Place floor slabs in alternate panels, long strip pattern, and following construction or contraction joints.
 2. Provide a bond-break filler strip, between concrete slab and abutting vertical surfaces and as detailed.
- B. For exterior areas, unless specified elsewhere, place concrete slabs directly over granular compacted fill and reinforce slabs as indicated on plans. Provide isolation

and contraction joints where detailed and, at intersections, corners and at abutments. Place contraction joints not more than 15-feet apart, unless detailed otherwise. Finish concrete true to grade, section and cross slope for sloped or crowned walks at 1.5 percent (one percent minimum and 2 percent maximum). Round edges to 1/8-inch radius except saw-cut joints. Finish steps in connection with walks with same finish as walks.

- C. At "house keeping slab", reinforce with synthetic fiber. Synthetic fiber shall be uniformly dispersed in concrete mix. The dosage shall be not less than 5 pounds per cubic yard of concrete. Average residual strength as tested by ASTM C1399/C1399M shall not be less than 200 psi.

3.10 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defective areas repaired and patched. Remove fins and other projections exceeding ACI 347R limits for class of surface specified.
- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Remove fins and other projections exceeding 1/8-inch in height.
 - 1. Apply to concrete surfaces exposed to public view or to be covered with a coating or covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, or painting.
 - 2. Do not apply rubbed finish to smooth-formed finish.
- C. Rubbed Finish: Apply the following to smooth-formed finished concrete:
 - 1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
 - 2. Grout-Cleaned Finish (Burlap): Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix one part Portland cement to one and one-half parts fine sand with a 1:1 mixture of bonding admixture and water. Add white Portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp for at least 36 hours.
 - 3. Cork-Floated Finish: Wet concrete surfaces and apply a stiff grout. Mix one part Portland cement and one part fine sand with a 1:1 mixture of bonding agent and water. Add white Portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Compress grout into voids by grinding surface. In a swirling motion, finish surface with a cork float.
 - 4. Cementitious Coating (Cement Wash): Prepare, apply and cure the coating per manufacturer's requirements. Apply in 1/16-inch thick coats not to exceed 1/8-inch. Cementitious coatings are finished coatings and not to be used as patching or repair materials. Cement-sand-water mix are not cementitious coatings as defined under item entitled "RELATED

MATERIALS" hereinabove. Under no circumstances will products containing gypsum plaster be allowed as a cementitious coating.

- D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.11 FINISHING FLOORS AND SLABS

- A. General: Comply with recommendations in ACI 302.1R for screeding, restraighening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes. Apply scratch finish to surfaces indicated and to surfaces to receive concrete floor topping or mortar setting beds for ceramic or quarry tile, Portland cement terrazzo, and other bonded cementitious floor finishes.
- C. C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraighening until surface is left with a uniform, smooth, granular texture. Apply float finish to surfaces indicated, to surfaces to receive trowel finish, and to floor and slab surfaces to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo.
- D. Trowel Finish: After applying float finish, apply first trowel finish and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
 - 1. Apply a trowel finish to surfaces indicated and to floor and slab surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin film-finish coating system.
 - 2. Finish surfaces to the following tolerances, measured within 24 hours according to ASTM E1155 for a randomly trafficked floor surface:
 - a. Specified overall values of flatness, F(F) 25; and levelness, F(L) 20; with minimum local values of flatness, F(F) 17; and levelness, F(L) 15.
 - b. Specified overall values of flatness, F(F) 35; and levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and levelness, F(L) 17; for slabs-on-grade.
 - c. Specified overall values of flatness, F(F) 30; and levelness, F(L) 20; with minimum local values of flatness, F(F) 24; and levelness, F(L) 15; for suspended slabs.
 - d. Specified overall values of flatness, F(F) 45; and levelness, F(L) 35; with minimum local values of flatness, F(F) 30; and levelness, F(L) 24.

3. Finish and measure surface so gap at any point between concrete surface and an unlevelled freestanding 10-foot-long straightedge, resting on 2 high spots and placed anywhere on the surface, does not exceed 1/8-inch.
- E. Trowel and Fine-Broom Finish: Apply a partial trowel finish, stopping after second troweling, to surfaces indicated and to surfaces where ceramic or quarry tile is to be installed by either thickset or thin-set method. Immediately after second troweling, and when concrete is still plastic, slightly scarify surface with a fine broom.
- F. Broom Finish: Apply a broom finish to exterior concrete walkways (covered and exposed), platforms, steps, and ramps, and elsewhere as indicated. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Contracting Officer before application.

3.12 MISCELLANEOUS CONCRETE ITEMS

- A. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.
- C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates of manufacturer furnishing machines and equipment.
- D. Electrical Work: Use 3/4-inch maximum size of aggregates for duct encasement. Unless detailed otherwise, encase underground ducts or conduits as follows:
 1. Provide 3-inches minimum concrete cover around ducts or conduits. Use spacers to place and hold ducts. Provide 18-inches minimum earth cover over top of concrete encasement unless otherwise detailed.
 2. For future connections, provide a one-foot section of ducts or conduits to extend beyond concrete encasement and terminate with a coupling or end cap.
- E. Concrete for Drainage, Sewer and Plumbing Systems:
 1. Do not use calcareous coarse aggregates in sewerage structures or components.
 2. Unless specified elsewhere, construct sewer manholes in accordance with the latest adopted/amended edition of Section 23 SEWER MANHOLES of the "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION".

3.13 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and with recommendations in ACI 305R for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms.
- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including slabs and other surfaces, by one or a combination of the following methods:
 - 1. Moisture Curing: Keep surfaces continuously moist for not less than 7 days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with a 12-inch lap over adjacent absorptive covers.
 - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12-inches, and sealed by waterproof tape or adhesive. Cure for not less than 7 days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 - a. Moist cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
 - b. Cure concrete surfaces to receive floor coverings with either a moisture- retaining cover or a curing compound that the manufacturer recommends for use with floor coverings.
 - 3. Curing Compound: Apply uniformly in continuous operation by spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.
 - 4. Curing: Apply uniformly to slabs indicated in a continuous operation by spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within 3 hours after initial application where recommended by the manufacturer. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.14 JOINT FILLING

- A. Prepare, clean, and install joint filler according to manufacturer's written instructions. Defer joint filling as long as possible. Do not fill joints until construction traffic has permanently ceased.
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.
- C. Install semi-rigid epoxy joint filler full depth in saw-cut joints and at least 2-inches deep in formed joints. Overkill joint and trim joint filler flush with top of joint after hardening.

3.15 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas. Remove and replace concrete that cannot be repaired and patched to the Contracting Officer's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part Portland cement to 2 and one-half parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
 - 1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2-inch in any dimension in solid concrete but not less than one-inch in depth. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
 - 2. Repair defects on surfaces exposed to view by blending white Portland cement and standard Portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
 - 3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by the Contracting Officer.
- D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
 - 1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01-inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
 - 2. After concrete has cured at least 14 days, correct high areas by grinding.

3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
 4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
 5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4-inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
 6. Repair defective areas, except random cracks and single holes one-inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mix as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
 7. Repair random cracks and single holes one-inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.
- E. Perform structural repairs of concrete, subject to the Contracting Officer's approval, using epoxy adhesive and patching mortar.
- F. Repair materials and installation not specified above may be used, subject to the Contracting Officer's approval.

3.16 DRYING CONCRETE SLABS TO LIMIT MOISTURE VAPOR EMISSIONS AND ALKALINITY

- A. For concrete slabs (on grade or suspended) receiving floor finish susceptible to vapor emissions, protect, dry or seal concrete slabs to meet the required vapor emission level(s) of the intended floor finish systems. If choosing to use a floor sealing system, furnish submittals for approval.
1. Once slab drying has started, protect it from getting wet prior to floor finish installation. Test floor for moisture and alkalinity.
 2. Test floor for vapor emission at locations and quantities recommended by the test kit manufacturer. Test pH levels of Concrete and humidity per ASTM F2170.
 3. If the concrete slab does not meet the vapor emission or alkalinity level(s), use other means such as mechanical drying or floor sealing system(s) (penetrants, coatings, or membranes) to achieve the required levels.

4. If the concrete floor slab does not meet the required alkalinity level, neutralize, cure, dry or seal concrete to bring the concrete to an acceptable alkalinity level.
 5. Be aware that no additional time or costs will be granted to meet the required vapor emission levels or alkalinity levels of the concrete surfaces.
- B. Floor Vapor Emission Control System:
1. Install per manufacturer's requirements to achieve a guaranteed vapor emission rate that meets the finished flooring recommended rates. Treatment shall not provide detrimental conditions to the concrete slab or floor covering materials. Make sure flooring adhesives are compatible with the treatment materials.
 2. Installer shall provide proof of installer's certification by the treatment manufacturer.
 3. Warranty Requirements: Refer to item entitled "WARRANTY" hereinabove.

3.17 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement according to requirements specified in this Article.
- B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C172/C172M shall be performed according to the following requirements:
1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mix exceeding 5 cubic yards, but less than 25 cubic yards, plus one set for each additional 50 cubic yards or fraction thereof.
 2. Slump: ASTM C143/C143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mix. Perform additional tests when concrete consistency appears to change.
 3. Air Content: ASTM C231/C231M, pressure method, for normal-weight concrete; ASTM C173/C173M, volumetric method, for structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.
 4. Concrete Temperature: ASTM C1064/C1064M; one test hourly when air temperature is 40 degrees Fahrenheit and below and when 80 degrees Fahrenheit and above, and one test for each composite sample.
 5. Unit Weight: ASTM C567/C567M, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.
 6. Compression Test Specimens: ASTM C31/C31M; cast and laboratory cure one set of 4 standard 6-inch by 12-inch cylinder specimens for each composite sample. Cast and field cure one set of 4 standard 6-inch by 12-inch cylinder specimens for each composite sample.
 7. Compressive-Strength Tests: ASTM C39/C39M;

February 27, 2026

- a. Test 2 laboratory-cured specimens at 7 days and 2 at 28 days.
 - b. Test 2 field-cured specimens at 7 days and 2 at 28 days.
 - c. A compressive-strength test shall be the average compressive strength from 2 specimens obtained from same composite sample and tested at age indicated.
- C. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
- D. Strength of each concrete mix will be satisfactory if every average of any 3 consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
- E. Test results shall be reported in writing to the Contracting Officer, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in work, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
- F. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by the Contracting Officer but will not be used as sole basis for approval or rejection of concrete.
- G. Moisture Vapor Emission Test: Standard test method meeting ASTM F1869.
- H. Alkalinity (pH Level) Testing: Standard test required for floor slabs and all wall and ceiling surfaces to receive painted finishes. Testing of concrete to receive paint finish may be conducted under SECTION 09901 - PAINTING.
- I. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by the Contracting Officer. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42/C42M or by other methods as directed by the Contracting Officer.

END OF SECTION

SECTION 04860 – SIMULATED STONE VENEER

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes simulated stone veneer in the following applications:
 - 1. Applied to cast-in-place concrete
- B. Related Sections include the following:
 - 1. Section 03300 – CAST-IN-PLACE CONCRETE.
 - 2. Section 07600 – FLASHING AND SHEET METAL

1.02 SUBMITTALS

- A. Submit in accordance with Section 01330 – SUBMITTAL PROCEDURES
- B. Product Data: Submit manufacturer's product data, specifications, installation procedures and all other data required to demonstrate compliance with the specified requirements for all mortar, grout, and admixtures.
- C. Stone Veneer and Colored Mortar Samples: Submit cured samples of mortar, with integral colorant added and stone veneer. Approved samples will establish color of mortar required for the project.
- D. Qualification Data: For Installer.

1.03 QUALITY ASSURANCE

- A. Installer Qualifications: An installer who employs experienced workers who are skilled in installing stone veneer assemblies similar in material, design, and extent to those indicated for this Project and whose projects have a record of successful in-service performance.
- B. Provide materials and completed work which complies with the requirements of local codes and regulations, and of standards referenced herein.
- C. Source Limitations for Mortar Materials: Obtain ingredients of a uniform quality for each mortar component from a single manufacturer and each aggregate from one source or producer.
- D. Mockups: Build mockups to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution.
 - 1. Build mockups for each type of stone veneer assembly in sizes approximately 10 feet long by height indicated on the Drawings by full thickness, including face, backup and coping.
 - 2. Replace unsatisfactory mock-up work, as directed, until acceptable by the Architect.
 - 3. Protect accepted mockups from the elements with weather-resistant membrane.

February 27, 2026

4. Approval of mockups is for color, texture, and blending of stone veneer; relationship of mortar and sealant colors to stone colors; tooling of joints; and aesthetic qualities of workmanship.
 - a. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless such deviations are specifically approved by Architect in writing.
 - b. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
5. All work shall be performed in accordance with all applicable codes and regulations and provide for all inspections and permits required by authorities having jurisdiction over such work.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- B. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- C. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.05 PROJECT CONDITIONS

- A. Protection of Stone Veneer Assemblies: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed stone veneer assemblies when construction is not in progress.
 1. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.
- B. Stain Prevention: Immediately remove mortar and soil to prevent them from staining the face of stone veneer assemblies.
 1. Protect base of walls from rain-splashed mud and mortar splatter by coverings spread on the ground and over the wall surface.
 2. Protect sills, ledges, and projections from mortar droppings.
 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
- C. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

1.06 WARRANTY

- A. Special Warranty: Provide manufacturer's standard limited warranty against defects in manufacturing for a period of 50 years following the date of Substantial Completion. The Manufacturer will provide free of charge, new materials to replace those which are determined to be defective.

February 27, 2026

1.07 EXTRA MATERIAL

- A. Furnish extra manufactured stone material in a variety of shapes and sizes in quantity equal to three percent of the installed stone.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Simulated Stone Veneer manufactured by Big Rock Manufacturing Inc. or approved equal.
- B. Equivalent products of other manufactures acceptable to the Architect will be considered in accordance with acceptable provisions of Sections 01330 – SUBMITTAL PROCEDURE AND Section 01630 – PRODUCT SUBSTITUTION PROCEDURES.

2.02 MATERIALS

- A. Simulated Stone Veneer: Moss Rock, unless indicated or selected otherwise, and as modified following mock-up review and acceptance.
- B. Portland Cement: ASTM C 150, Type I or II. Provide natural color or white cement as required to produce mortar color indicated.
- C. Hydrated Lime: Shall not be used.
- D. Masonry Cement: ASTM C 91, Type N.
- E. Masonry Sand Aggregate: ASTM C 144:
- F. Mortar Color: Iron oxide colors as selected by Architect
- G. Water: Potable.

2.03 MORTAR MIXES

- A. Masonry Mortar: Comply with ASTM C 270 Proportion Specification.
 - 1. Mortar for Pointing Stone Veneer: Type N.
- B. Latex-Modified Portland Cement Setting Mortar: Proportion and mix Portland cement, aggregate, and latex additive to comply with latex-additive manufacturer's written instructions.
- C. Pigmented Mortar: Select and proportion pigments with other ingredients to produce color required.
 - 1. Pigments shall not exceed 5 percent of mortar cement or masonry cement by weight.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine surfaces indicated to receive stone veneer assemblies, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
 - 1. Examine wall framing, sheathing, to verify that stud locations are suitable for spacing of veneer anchors.
 - 2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Advise installers of other work about specific requirements for placement of reinforcement, flashing, and similar items to be built into stone veneer assemblies.
- B. Accurately mark stud centerlines on face of self-adhering membrane or building paper before beginning stone installation.

3.03 SETTING OF STONE VENEER

- A. Sort stone veneer before it is placed in wall to remove stone that does not comply with requirements relating to aesthetic effects, physical properties, or fabrication or that is otherwise unsuitable for intended use.
- B. Apply 1/2-inch to 3/4-inch of mortar to the concrete unit masonry backing using a mason's trowel, covering a maximum of 10 square feet at one time. Press each stone in to the mortar setting bed firmly enough to squeeze mortar out and around the stone's edges.
- C. Arrange stone veneer for good fit in un-coursed rubble pattern with joint widths within tolerances indicated. Insert small stones into spaces between larger stones as needed to produce joints as uniform in width as practical. Generally use larger stone at the bottom and smaller stones at the top of the wall.
- D. Arrange stone veneer with color and size variations uniformly dispersed for an evenly blended appearance.
- E. Maintain uniform joint widths except for variations due to different stone sizes and where minor variations are required to maintain bond alignment, if any. Lay walls with joints not more than 3/8 inch at widest points.
- F. Rake out joints for pointing with mortar before setting mortar has hardened. Rake joints to uniform depths with square bottoms and clean sides.

3.04 POINTING

- A. Point stone joints by placing and compacting pointing mortar in layers not more than 3/8-inch deep. Compact each layer thoroughly and allow to become thumbprint hard before applying next layer.
- B. Tool joints, when pointing mortar is thumbprint hard, with a smooth jointing tool to produce the following joint profile:

February 27, 2026

1. Joint Profile: Concave

3.05 ADJUSTING AND CLEANING

- A. Remove and replace stone veneer assemblies of the following description:
 1. Broken, chipped, stained, or otherwise damaged stone. Stone may be repaired if methods and results are approved by Architect.
 2. Defective joints.
 3. Stone veneer assemblies not matching approved samples and mockups.
 4. Stone veneer assemblies not complying with other requirements indicated.
- B. Replace in a manner that result in stone veneer assemblies' matching approved samples and mockups, complying with other requirements, and showing no evidence of replacement.
- C. In-Progress Cleaning: Clean stone veneer assemblies as work progresses. Remove mortar fins and smears before tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean stone veneer assemblies as follows:
 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 2. Test cleaning methods on mockup; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before cleaning stone veneer assemblies.
 3. Clean stone veneer assemblies in accordance to manufacturer's instructions.
 4. Apply breather type (non-film forming) masonry sealer to completed surfaces in accordance with manufacturer's instructions.

3.06 EXCESS MATERIALS AND WASTE

- A. Excess Stone: Stack excess stone where directed by Owner for Owner's use.
- B. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above, and other waste, and legally dispose of off Owner's property.

END OF SECTION

SECTION 05120 - STRUCTURAL STEEL

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes structural steel.
- B. Related Work Described Elsewhere: SECTION 09901 - PAINTING for surface preparation and priming requirements.

1.02 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Engineer structural steel connections required by the Contract Documents to be selected or completed by the fabricator to withstand design loadings indicated.
- B. Engineering Responsibility: Engage a fabricator who utilizes a qualified Professional Engineer to prepare calculations, shop drawings, and other structural data for structural steel connections.

1.03 SUBMITTALS

- A. Submit under the provisions of Section 01330 – SUBMITTAL PROCEDURES.
- B. Product Data: Submit product data for each type of product specified.
- C. Shop Drawings: Submit shop drawings detailing fabrication of structural steel components.
 - 1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
 - 2. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld.
 - 3. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify high-strength bolted slip-critical, direct-tension, or tensioned shear/bearing connections.
 - 4. Include shop drawings signed and sealed by a qualified Professional Engineer responsible for their preparation.
- D. Qualification Data: Submit qualification data for firms and persons specified in item entitled "QUALITY ASSURANCE" hereinbelow to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified. Mill test reports signed by manufacturers certifying that their products, including the following, comply with requirements.
 - 1. Structural steel, including chemical and physical properties.
 - 2. Bolts, nuts, and washers, including mechanical properties and chemical analysis.
 - 3. Direct-tension indicators.
 - 4. Shear stud connectors.

February 27, 2026

5. Shop primers.
6. Nonshrink grout.

1.04 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer who has completed structural steel work similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.
- B. Fabricator Qualifications: Engage a firm experienced in fabricating structural steel similar to that indicated for this Project and with a record of successful in- service performance, as well as sufficient production capacity to fabricate structural steel without delaying the work.
- C. Comply with applicable provisions of the following specifications and documents:
 1. AISC's "Specification for Structural Steel Buildings---Allowable Stress Design and Plastic Design".
 2. AISC's "Specification for Allowable Stress Design of Single-Angle Members".
 3. AISC's "Specification for Load and Resistance Factor Design of Single-Angle Members".
 4. AISC's "Seismic Provisions for Structural Steel Buildings".
 5. ASTM A6/A6M, "Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling".
 6. Research Council on Structural Connections' (RCSC) "Specification for Structural Joints Using High-Strength Bolts".
- D. Professional Engineer Qualifications: A Professional Engineer who is legally authorized to practice in the jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for projects with structural steel framing that are similar to that indicated for this Project in material, design, and extent.
- E. Welding Standards: Comply with applicable provisions of AWS D1.1, "Structural Welding Code--Steel". Present evidence that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver structural steel to Project site in such quantities and at such times to ensure continuity of installation.
- B. Store materials to permit easy access for inspection and identification. Keep steel members off the ground by using pallets, platforms, or other supports. Protect steel members and packaged materials from corrosion and deterioration.
 1. Store fasteners in a protected place. Clean and relubricate bolts and nuts that become dry or rusty before use.

February 27, 2026

2. Do not store materials on structure in a manner that might cause distortion or damage to members or supporting structures. Repair or replace damaged materials or structures as directed.

1.06 SEQUENCING

- A. Supply anchorage items to be embedded in or attached to other construction without delaying the work. Provide setting diagrams, templates, instructions, and directions, as required, for installation.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Wide Flange Shapes: ASTM A992/A992M.
- B. Channels, Angles, Plates, and Bars: ASTM A36/A36M.
- C. Cold-Formed Structural Steel Tubing: ASTM A500/A500M, Grade C.
- D. Steel Pipe: ASTM A53/A53M, Type E or S, Grade B.
 1. Weight Class: Standard.
 2. Finish: Hot-dipped galvanized and painted.
- E. Anchor Rods, Bolts, Nuts, and Washers: As follows:
 1. Headed and Unheaded Anchor Rods: ASTM F1554, Grade 36, unless otherwise indicated on drawings.
 2. Hot-Dip Zinc Coating: ASTM A153/A153M, Class C.
 3. Nuts: ASTM A563/A563M heavy hex carbon steel, galvanized.
 4. Plate Washers: ASTM A36/A36M, galvanized.
- F. Nonhigh-Strength Bolts, Nuts, and Washers: ASTM A307, Grade A; carbon- steel, hex-head bolts; carbon-steel nuts; and flat, unhardened steel washers.
 1. Finish: Hot-dip zinc-coating, ASTM A153/A153M, Class C.
 2. Nuts: ASTM A563/A563M heavy hex carbon steel, galvanized.
 3. Plate Washers: ASTM A36/A36M, galvanized.
- G. High-Strength Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325, Type 1, heavy hex steel structural bolts, heavy hex carbon-steel nuts, and hardened carbon-steel washers.
 1. Finish: Hot-dip zinc-coating, ASTM A153/A153M, Class C.
 2. Nuts: ASTM A563/A563M heavy hex carbon steel, galvanized.
 3. Hardened Carbon-Steel Washers: ASTM F436/F436M.
- H. Welding Electrodes: Comply with AWS requirements.

February 27, 2026

2.02 PRIMER

- A. Galvanizing: Steel members and components shall be hot-dipped galvanized after fabrication in accordance with ASTM A123/A123M and ASTM A153/A153M, as applicable.
- B. Fill vent holes and grind smooth after galvanizing.
- C. Galvanizing Repair Paint: High-zinc-dust-content paint for coating field welds and repair painting galvanized steel, with dry film containing not less than 93 percent zinc dust by weight and complying with DOD-P-21035A or SSPC-Paint 20.

2.03 GROUT

- A. Nonmetallic, Shrinkage-Resistant Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, Portland cement, shrinkage compensating agents, plasticizing and water-reducing agents, complying with ASTM C1107/C1107M, of consistency suitable for application, and a 30-minute working time.

2.04 FABRICATION

- A. Fabricate and assemble structural steel in shop to greatest extent possible. Fabricate structural steel according to AISC specifications referenced in this Section and in shop drawings.
 - 1. Camber structural steel members where indicated.
 - 2. Mark and match-mark materials for field assembly.
 - 3. Fabricate for delivery a sequence that will expedite erection and minimize field handling of structural steel.
 - 4. Complete structural steel assemblies, including welding of units, before starting shop-priming operations.
 - 5. Comply with fabrication tolerance limits of AISC's "Code of Standard Practice for Steel Buildings and Bridges" for structural steel.
- B. Fabricate architecturally exposed structural steel with exposed surfaces smooth, square, and free of surface blemishes, including pitting, rust and scale seam marks, roller marks, rolled trade names, and roughness.
 - 1. Remove blemishes by filling, grinding, or by welding and grinding, prior to cleaning, treating, and shop priming.
 - 2. Comply with fabrication requirements, including tolerance limits, of AISC's "Code of Standard Practice for Steel Buildings and Bridges" for architecturally exposed structural steel.
- C. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible. Plane thermally cut edges to be welded.
- D. Finishing: Accurately mill ends of columns and other members transmitting loads in bearing.

2.05 SHOP CONNECTIONS

- A. Shop install and tighten nonhigh-strength bolts, except where high-strength bolts are indicated.
- B. Shop install and tighten high-strength bolts according to RCSC's "Specification for Structural Joints Using High-Strength Bolts".
- C. Weld Connections: Comply with AWS D1.1 for procedures, appearance and quality of welds, and methods used in correcting welding work.
 - 1. Assemble and weld built-up sections by methods that will maintain true alignment of axes without warp.
 - 2. Verify that weld sizes, fabrication sequence, and equipment used for architecturally exposed structural steel will limit distortions to allowable tolerances. Prevent surface bleeding of back-side welding on exposed steel surfaces. Grind smooth exposed fillet welds 1/2-inch and larger. Grind flush butt welds. Dress exposed welds.

2.06 SOURCE QUALITY CONTROL

- A. Correct deficiencies in or remove and replace structural steel that inspections and test reports indicate do not comply with specified requirements.
- B. Additional testing, at Contractor's expense, will be performed to determine compliance of corrected work with specified requirements.
- C. In addition to visual inspection, shop-welded connections will be inspected and tested according to AWS D1.1 and the inspection procedures listed below, at testing agency's option.
 - 1. Liquid Penetrant Inspection: ASTM E165/E165M.
 - 2. Magnetic Particle Inspection: ASTM E709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
 - 3. Radiographic Inspection: ASTM E94/E94M; minimum quality level "2-2T".
 - 4. Ultrasonic Inspection: ASTM E164.

2.07 MISCELLANEOUS MATERIAL

- A. Bituminous Paint: SSPC-Paint 12 (cold-applied asphalt mastic).

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Before erection proceeds, and with the steel erector present, verify elevations of concrete and masonry bearing surfaces and locations of anchorages for compliance with requirements.
- B. Do not proceed with erection until unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place, unless otherwise indicated.

3.03 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303, "Code of Standard Practice for Steel Buildings and Bridges", and ANSI/AISC 360, "Specification for Structural Steel Buildings - Allowable Stress Design".
- B. Base and Bearing Plates: Clean concrete and masonry bearing surfaces of bond-reducing materials and roughen surfaces prior to setting base and bearing plates. Clean bottom surface of base and bearing plates.
 - 1. Set base and bearing plates for structural members on wedges, shims, or setting nuts as required.
 - 2. Tighten anchor bolts after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of base or bearing plate prior to packing with grout.
 - 3. Pack grout solidly between bearing surfaces and plates so no voids remain. Finish exposed surfaces, protect installed materials, and allow to cure. Comply with manufacturer's instructions for proprietary grout materials.
- C. Maintain erection tolerances of structural steel within AISC 303.
- D. Align and adjust various members forming part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
 - 1. Level and plumb individual members of structure.
 - 2. Establish required leveling and plumbing measurements on mean operating temperature of structure. Make allowances for the difference between temperature at time of erection and mean temperature at which structure will be when completed and in service.
- E. Splice members only where indicated.
- F. Remove erection bolts on welded structural steel; fill holes with plug welds; and grind smooth at exposed surfaces.
- G. Do not use thermal cutting during erection.
- H. Do not enlarge unfair holes in members by burning or by using drift pins. Ream holes that must be enlarged to admit bolts.
- I. Corrosion Protection: Coat steel surfaces which will be in contact with grout, concrete, or dissimilar metals, with a heavy coat of bituminous paint. Prior to paint application, clean galvanized surfaces with concentrated, water reducible phosphoric acid detergent blend, MPI #25, so surface is free of oil and surface contaminants and surface is lightly etched to enhance paint adhesion.

3.04 FIELD CONNECTIONS

- A. Unless noted otherwise, all bolted connections shall be made with ASTM F3125/F3125M high-strength bolts, galvanized.
- B. All bolted connections are "snug-tightened joints" as defined in RCSC's "Specification for Structural Joints Using High-Strength Bolts".
- C. Weld Connections: Comply with AWS D1.1 for procedures, appearance and quality of welds, and methods used in correcting welding work.
 - 1. Comply with AISC specifications referenced in this Section for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.
 - 2. Assemble and weld built-up sections by methods that will maintain true alignment of axes without warp.
 - 3. Verify that weld sizes, fabrication sequence, and equipment used for architecturally exposed structural steel will limit distortions to allowable tolerances. Prevent surface bleeding of back-side welding on exposed steel surfaces. Grind smooth exposed fillet welds 1/2-inch and larger. Grind flush butt welds. Dress exposed welds.

3.05 FIELD QUALITY CONTROL

- A. Contractor will engage an independent testing and inspecting agency to perform field inspections and tests and to prepare test reports. Testing agency will conduct and interpret tests and state in each report whether tested work complies with or deviates from requirements.
- B. Correct deficiencies in or remove and replace structural steel that inspections and test reports indicate do not comply with specified requirements.
- C. Additional testing, at Contractor's expense, will be performed to determine compliance of corrected work with specified requirements.
- D. In addition to visual inspection, field-welded connections will be inspected and tested according to AWS D1.1 and the inspection procedures listed below, at testing agency's option.
 - 1. Liquid Penetrant Inspection: ASTM E165/E165M.
 - 2. Magnetic Particle Inspection: ASTM E709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
 - 3. Radiographic Inspection: ASTM E94/E94M; minimum quality level "2-2T".
 - 4. Ultrasonic Inspection: ASTM E164.

3.06 CLEANING

- A. Touchup Painting:
 - 1. Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint. Apply paint to exposed areas using the same material as used for shop painting. Apply with brush or spray to provide a minimum dry film thickness of 1.5 mils.

February 27, 2026

2. Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on structural steel are included in SECTION 09901 - PAINTING.
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and apply galvanizing repair paint according to ASTM A780/A780M.

END OF SECTION

SECTION 05140 – ALUMINUM EQUIPMENT SCREENS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Design, engineer, manufacture, and installation of aluminum equipment screen panel infills attached to steel post.
2. Miscellaneous attachments, anchors, and fasteners as indicated on the drawings and required by system performance.
3. Applied finish of aluminum extrusions, sheet and steel posts.

B. Work Described Elsewhere

1. Section 05120 – STRUCTURAL STEEL

1.02 CODES AND STANDARDS

- A. In addition to referenced codes and standards within this specification, the work shall comply with the latest edition of the following standards. When conflicts arise between standards, the more stringent shall apply:

B. Aluminum Association:

1. Aluminum Design Manual - Specifications for Aluminum Structures

C. American Architectural Manufacturers Association (AAMA)

1. AAMA 800 Voluntary Specifications and Test Methods for Sealants
2. AAMA 2605, Voluntary Specification, Performance Requirements, and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.

D. American Society for Testing and Materials (ASTM) Publications:

1. ASTM A 36 Standard Specification for Carbon Structural Steel
2. ASTM A 123 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
3. ASTM A 500 Standard Specification For Cold-Formed Welded And Seamless Carbon Steel Structural Tubing In Rounds And Shapes
4. ASTM B 117 Practice for Operating Salt Spray (Fog) Apparatus
5. ASTM B 209 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
6. ASTM B 211 Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire.
7. ASTM B 221 Standard Specification for Aluminum and Aluminum-Alloy Extruded Bar, Rods, Wire, Profiles, and Tubes.
8. ASTM D 1187 Specification for Asphalt Base Emulsions for Use as Pro-

protective Coatings for Metal.

- E. American Welding Society
 - 1. AWS D1.1 - Structural Welding Code, Steel
 - 2. AWS D1.2 - Structural Welding Code, Aluminum
- B. National Association of Architectural Metal Manufacturers (NAAMM)
 - 1. NAAMM MFM, "Metal Finishes Manual."
- C. IFI – Industrial Fasteners Institute
- D. International Building Code: IBC 2018 with Kauai County amendments

1.03 QUALITY ASSURANCE

- A. Product Options: Information on Drawings and in Specifications establishes requirements for system's aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including structural analysis, preconstruction testing, field testing, and in-service performance.
- B. Manufacturer: Engage a single firm to assume undivided responsibility for engineering, fabrication, installation and total coordination of all components of the aluminum equipment screen work. Provision of products from numerous sources for site assembly without complete single source design and supply responsibility is not acceptable.
 - 1. Firm must demonstrate at least 6 years of successful experience in the fabrication of aluminum screens, of the types required for this project.
- C. Installer qualifications: Company experienced in erecting aluminum systems and acceptable to manufacturer for installing proposed structure.
 - 1. Firm must demonstrate at least 10 years of successful experience in the installation of aluminum screens, of the types required for this project
- D. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review
- E. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication, where possible. Do not delay job progress; allow for trimming and fitting where taking field measurements before fabrication might delay work.
- F. Shop Assembly: Pre-assemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- G. Qualifications of Welders: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1 – Structural Welding Code, Steel

February 27, 2026

2. AWS D1.2 - Structural Welding Code, Aluminum

1.04 SUBMITTALS

- A. Submit under the provisions of Section 01330 SUBMITTAL PROCEDURES.
- B. Manufacturer's Data: Submit manufacturers product data for all manufactured products. Include color charts for all materials exposed and requiring selection of finish color.
- C. Shop Drawings: Submit complete shop drawings of all aluminum screen work to the Architect for review and approval before fabrication. Detail all members, connections, and anchorage not specifically shown but which are required to complete the work. Shop Drawings shall be stamped by the same engineer responsible for preparing the structural analysis.
- D. Structural Analysis: Submit structural calculations showing that the aluminum screen panels and their connections meets the performance requirements set forth in this section. Calculation shall be stamped and signed by a practicing engineer licensed in the State of Hawaii.
- E. Material Safety Data Sheets (MSDS): Submit MSDS for all materials.
- F. Welding certificates.
- G. Samples: Submit samples of the following in the quantity indicated:
 - 1. Metal Screen: Submit three 12-inch square samples showing pattern in finish and color specified or scheduled.

1.05 SYSTEM PERFORMANCES

- A. Delegated Design: Design aluminum screen components and attachments, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. General: In engineering the aluminum screen components and attachments to withstand structural loads indicated, determine allowable design working stresses of screen materials based on the following:
 - 1. Aluminum: The lesser of minimum yield strength divided by 1.65 or minimum ultimate tensile strength divided by 1.95.
- C. Structural Performance: Structural supports, frames, plate and anchorages shall be designed and furnished by aluminum screen manufacturer/fabricator to withstand loads created by the following criteria:
 - 1. Wind Loads: Design windscreen components and attachments to withstand wind load design pressures, as indicated in the Cladding Wind Load Study written by RWDI, dated 04/30/2020 and as determined by Chapter 6 of ASCE/SEI 7 "Minimum Design Loads for Buildings and Other Structures."
 - a. Exposure Category: Exposure C
 - b. Ultimate Design Wind Speed: 168 mph
 - c. Importance Factor: 1.5
 - 2. Seismic Design Criteria: As indicated on the Structural Drawings.

- D. At the condition where the windscreen act as guards design screen components and attachments to withstanding structural loads required by the current International Building Code as amended for guards and ASTM E 985 but not less than the following structural loads without exceeding allowable design working stress of materials for grille, anchors, and connections based on testing performed in accordance with ASTM E 894 and ASTM E 935.
 - 1. Infill Area of Screen: Capable of withstanding a horizontal concentrated load of 50 pounds applied to 1 square foot at any point in system, including panels, intermediate rails, balusters, louvers, or other elements composing infill area.
- E. Thermal Movements: Design aluminum windscreen panels to allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change (Range): 50 degrees F, ambient; 120 degrees F, material surfaces.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in original sealed manufacturer's packing. Until ready for installation.
- B. Store materials in dry secure location.
- C. Store in accordance with manufacturer's written instructions.
- D. Protection: The Contractor shall use all means necessary to protect metal work before, during and after installation and to protect the installed work and materials of all other trades.
- E. Replacement: In the event of damage, the Contractor shall immediately make all repairs and replacements necessary to the satisfaction of the Architect and at no additional cost to the Owner.

1.07 COORDINATION

- A. Coordinate the fabrication and attachments design of the aluminum screen panels with the steel support post layout and spacing.

1.08 WARRANTY

- A. Submit manufacturer's warranty certifying that screen work was furnished and installed in accordance with the Contract Documents.
- B. Provide manufacturer's warranty to cover design, fabrication, and materials against defects and failure to perform. Warranty to provide for replacement of defective components.
 - 1. Warranty Period: One (1) years from the date of Substantial Completion
- C. Provide paint manufacturer's warranty for coating system under Hawaiian weather conditions, provide following as a guide for expected warranty:
 - 1. Fluoropolymer paint finish shall be free from material defects and shall be warranted for 20 years from the date of Substantial Completion.

February 27, 2026

2. Warranty shall cover paint finish system against peeling, chipping, cracking or color change in excess of 5 NBS units when tested according to ASTM D 2244 during the term of this warranty.
3. In the event that the above paint system fails under normal wind and weathering conditions within the warranty period, the manufacturer/supplier shall replace or repair as necessary any panels whose factory color finish that fails.

PART 2 - PRODUCTS

2.01 MANUFACTURER

- A. Basis of Design Product: The design is based upon Vision Barrier Screens - Econoscreen RF-20 as manufactured by Construction Specialties, Inc. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:
 1. Hendrick Architectural
 2. McNichols Co.
 3. Syr-Tech Perforated & Rolled Formed Metal
 4. Accurate Alloys, Inc.

2.02 MATERIALS

- A. Aluminum: Provide alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with strength and durability properties for each aluminum form required not less than that of alloy and temper designated below.
 1. Blade Material: Formed Aluminum 3003-H-14
 2. Blade Thickness: 0.20-inch
 3. Blade Width and Spacing: 3-1/2-inch wide at 4-inch on center.
 4. Blade Length: As indicated on the drawings.
 5. Shape: Formed panel edges per design details.
 6. Attachment: 3" Horizontal Hat Runners with Blade Locks
 7. Color: As indicated on the Drawings
- B. Steel:
 1. Cold-Formed Hollow Structural Sections: ASTM A 500/A 500M, Grade B, structural tubing.
 - a. Post Size: 3-inches by 4-inches having a wall thickness required by the structural analysis.
 2. Plate and Bar: ASTM A 36.
 - a. Plate Size: As required by the structural analysis.
 3. Galvanizing: Apply zinc coating by the hot-dip process to structural steel according to ASTM A 123.

2.03 WELDING MATERIALS, FASTENERS, ANCHORS AND ADHESIVES

- A. Welding Electrodes and Filler Metal: Provide type and alloy of filler metal and electrodes as recommended by producer of metal to be welded, complying with applicable AWS specifications, and as required for color match, strength, and compatibility in fabricated items.
- B. Any fasteners in wet or exposed areas of the wall shall be series 300, non-magnetic stainless steel. All other fasteners shall be hot-dipped galvanized unless otherwise noted.
 - 1. Use types, gages, and lengths to suit unit installation conditions.
 - 2. Use Phillips flat-head machine screws for exposed fasteners, unless otherwise indicated.
- C. Exposed Fasteners: Where indicated or required provide flat-head fasteners with exposed heads finished to match exposed aluminum components.
- D. Threaded Concrete Anchors:
 - 1. Material and Finish: Bi-Metal, 300 Series Stainless Steel head and shank fused to harden steel tapping threads and point with corrosion resistant coating with not less than 800 hours of salt-spray resistance according to ASTM B 117.
 - 2. Basis of Design: Elco Industries, Inc.; Aggre-Gator; Hex Washer Head with Silver Stalgard finish.
 - 3. Not Acceptable: Self-drilling fasteners, screw in plugs, and powder actuated fasteners are not permitted in concrete.
- E. Self-Drilling and Self-Tapping Drill Screws: Complying with ASTM A 449
 - 1. Material and Finish: Hardening alloy steel with corrosion resistant coating with not less than 800 hours of salt-spray resistance according to ASTM B 117.
 - 2. Head Type:
 - a. Concealed Fasteners: Hex Washer Head
 - b. Exposed Fasteners: Flat Head
 - 3. Acceptable Manufacturers:
 - a. Elco Industries, Inc.; DrillFlex Fastener; Hex with Silver Stalgard GB corrosion resistant finish
 - b. Hilti, Inc.; Kwik-Flex, Hex with Kwik-Cote corrosion resistant finish.
 - c. ITW Buildex; Teks Select, Climaseal ACR corrosion resistant finish.

2.04 MISCELLANEOUS MATERIALS

- A. Bituminous Paint: SSPC-Paint 12 (cold-applied asphalt mastic).
- B. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.05 FABRICATION

- A. General: Fabricate metal screens to design, dimensions and details shown. Provide members in sizes and profiles indicated, with supporting members and brackets of size and spacing shown, but not less than required to comply with requirements indicated for structural performance and delegated structural analysis.
- B. Welded Connections: Use welding method which is appropriate for metal and finish indicated and that develops strength required to comply with structural performance criteria. Finish exposed welds and surfaces complying with NOMMA Joint Finishes; "Finish #1 – No Evidence of Welded Joint". Weld all around at connections, including at fittings. Perform welded connections prior to finishing.
- C. Nonwelded Connections: To be manufacturer's standard concealed mechanical fasteners and fittings unless otherwise indicated. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.
- D. Brackets, Flanges, Fittings, and Anchors: Provide manufacturer's standard wall brackets, flanges, miscellaneous fittings, and anchors for interconnection of members to other work, unless otherwise indicated.
- E. Furnish inserts and other anchorage devices for connecting screen systems to concrete or masonry work. Fabricate anchorage devices which are capable of withstanding loadings imposed by the screen assembly. Coordinate anchorage devices with supporting structure.
- F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.
- G. Provide weep holes, or another means to evacuate entrapped water in hollow sections of members that are exposed to exterior or to moisture from condensation or other sources.
- H. Fabricate joints that will be exposed to weather in a manner to exclude water.
- I. Use materials of size and thickness shown but not less than what is required by the delegated structural analysis. Work to dimensions shown or accepted on shop drawings, using proven details of fabrication and support. Use type of materials shown or specified for various components of work.
- J. Miscellaneous Framing and Supports:
 - 1. Provide miscellaneous framing and supports as required to complete the screen work.
 - 2. Fabricate miscellaneous units to sizes, shapes and profiles shown or, if not shown, of required dimensions to receive adjacent other work to be retained by framing. Cut, drill and tap units to receive hardware and similar items.
- K. Aluminum Attachment Clips: Fabricated aluminum attachment clips to the shapes and sizes indicated on the approved shop drawings and as required to accommodate and withstand the loads as determined and indicated in the structural analysis. Clips to be located, welded, and fastened in accordance to the structural analysis to the back of screen. Provide protection of dissimilar metals where aluminum clip come in contact with steel posts.

2.06 METAL FINISH

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
 - 1. Aluminum Finishes: Finish designations prefixed by AA comply with system established by the Aluminum Association for designating aluminum finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipment.
- C. Aluminum and Steel Finish: Electrostatically applied colored polyester powder coating heat cured to chemically bond finish to metal substrate. Comply with AAMA 2604.
 - 1. Minimum hardness measured in accordance with ASTM D3363: 2H.
 - 2. Direct impact resistance tested in accordance with ASTM D2794. Withstand 160 inch-pounds.
 - 3. Salt spray resistance tested in accordance with ASTM B117: No undercutting, rusting, or blistering after 500 hours in 5 percent salt spray at 95 degrees F and 95 percent relative humidity and after 1000 hours less than 3/16- inch undercutting.
 - 4. Weatherability tested in accordance with ASTM D822: No film failure and 88 percent gloss retention after 1 year exposure in South Florida with test panels tilted at 45 degrees.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Coordinate setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, such as anchor bolts, and miscellaneous items having integral anchors, which are to be embedded in concrete as masonry construction. Coordinate delivery of such items to project site.
- B. Prior to all work of this Section, the Contractor shall carefully inspect the installed work of all other trades and verify that all such work is complete to the point where fabrication and installation of the work of this Section may properly commence.
- C. The Contractors shall make all required measurements in the field to ensure proper and adequate fit of metal screen.
- D. Examine the areas and conditions under which aluminum screens will be installed and correct conditions detrimental to the proper and timely completion of the work. Do not proceed until unsatisfactory conditions have been corrected and approved by the Architect.

3.02 INSTALLATION, GENERAL

- A. Locate and place windscreen units plumb, level, and in proper alignment with adjacent work.

- B. Fastening to In Place Construction: Provide anchorage devices and fasteners where necessary for securing screens to in place construction, which will develop anchorage meeting or exceeding all system performance requirements.
- C. All welding shall be done by skilled mechanics qualified or licensed in accordance with local building regulations and shall conform to the recommended practices of the American Welding Society. All welds or damage to structural steel coating must be prepared and touched up with zinc rich primer as described herein.
- D. Do not weld or abrade surfaces of screen components that have been coated or finished after fabrication and are intended for field connection by mechanical or other means without further cutting or fitting.
- E. Fit exposed connections accurately together to form tight, hairline joints.
- F. Cutting, Fitting and Placement: Perform cutting, drilling, and fitting required for installation of screen structure. Set work accurately in location, alignment and elevation, plumb, level, true and free of rack, measured from established lines and levels.
- G. Align screen units so that variations from level for horizontal edges, parallel for aligned members shall not exceed 1/8 inch in 12 feet.
- H. Repair finishes damaged by cutting, welding, soldering, and grinding operations required for fitting and jointing. Restore finishes so there is no evidence of corrective work. Return items which cannot be refinished in field to shop, make required alterations and refinish entire unit, or provide new units.
- I. Protect galvanized and nonferrous metal surfaces from corrosion or galvanic action by application of a heavy coating of bituminous paint on surfaces which will be in contact with concrete, masonry, or dissimilar metals.
- J. Screen Blades shall be attached to support posts with the appropriate type fastener. Fastener heads exposed to view shall receive the seam finish and color as the aluminum screen panel and attachment clips.
- K. Anchor Screen posts by bolting post and base plate assembly to concrete structure with concrete screws of size and type capable of attaining the structural performance required by these specifications and reviewed and approved structural analysis. If required use non-shrink leveling grout to erect posts plumb.

3.03 CONNECTIONS

- A. Nonwelded Connections: Use manufacturer's standard mechanical joints for permanently connecting components. Use wood blocks and padding to prevent damage to screen framing members and fittings. Seal recessed holes of exposed locking screws using plastic filler cement colored to match finish of the screen panel framing.
- B. Welded Connections: Use welding method which is appropriate for metal and finish indicated and that develops strength required to comply with structural performance criteria. Finish exposed welds and surfaces smooth, flush, and blended to match adjoining surfaces complying with NOMMA Joint Finishes; "Finish #1 – No Evidence of Welded Joint". Weld all around at connections, including at fittings. Cope or butt components to provide 100 percent contact or use manufacturer's standard fittings designed for this purpose.

3.04 TOLERANCES

- A. All parts of the work, when completed, shall be within the following tolerances:
 - 1. Maximum variation from plane or location shown on approved shop drawings: 1/8-in. per 12-ft. length, or 1/2-in. in total length.
 - 2. Maximum offset from true alignment between two members abutting end-to-end, edge-to-edge in line or separated by less than 3-in.: 1/32-inch.

3.05 ADJUST AND TOUCH-UP

- A. Touch-Up Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting. Apply by brush or spray to provide a minimum dry film thickness of 2.0 mils.
- B. For Galvanized Surfaces: Clean field welds, bolted connections and abraded areas and apply galvanizing repair paint to comply with ASTM A 780.

3.06 PROTECTION

- A. Protect finishes of the aluminum construction from damage during construction period by use of temporary protective coverings approved by aluminum screen manufacturer. Remove protective covering at time of Substantial Completion.
- B. Restore finishes damaged during installation and construction period so that no evidence remains of correction work. Return items which cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units as required.

3.07 CLEAN UP

- A. After installation, all surfaces shall be cleaned and ready to receive final treatment. All unused materials, tools and equipment shall be removed from the project site.
- B. At the end of each work day, and as directed by the Architect and at the completion of the work, all rubbish, debris, fines, etc., accumulated from the work of this Section shall be removed from the project site and the area left neat and clean to the satisfaction of the Architect

END OF SECTION

SECTION 05310 - STEEL DECK

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes roof deck.

1.02 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent agency qualified according to ASTM E329 for testing indicated.
- B. Welding: Qualify procedures and personnel according to AWS D1.3, "Structural Welding Code - Sheet Steel".
- C. Fire-Test-Response Characteristics: Where indicated, provide steel deck units identical to those tested for fire resistance per ASTM E119 by a testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Fire-Resistance Ratings: Indicated by design designations of applicable testing and inspecting agency.
 - 2. Steel deck units shall be identified with appropriate markings of applicable testing and inspecting agency.
- D. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members".

1.03 SUBMITTALS

- A. Submit under the provisions of Section 01330 – SUBMITTAL PROCEDURES.
- B. Product Data: Submit product data for each type of deck, accessory, and product indicated.
- C. Shop Drawings: Submit shop drawings showing layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.
- D. Product Certificates: Submit product certificates for each type of steel deck, signed by product manufacturer.
- E. Certificates: Submit welding certificates.
- F. Reports: Submit field quality-control test and inspection reports.
- G. Product Test Reports: Submit product test reports based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that the power-actuated mechanical fasteners complies with requirements.
- H. Research/Evaluation Reports: Submit research/evaluation reports for steel deck.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.
- B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.

PART 2 - PRODUCTS

2.01 ROOF DECK - REGULAR SPAN

- A. Steel Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck", in SDI Publication No. 30, and with the following:
 - 1. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS), Grade 33, G90 zinc coating.
 - 2. Profile: As indicated on the drawings.
 - 3. Span Condition: Triple span or more, unless otherwise indicated.
 - 4. Side Laps: Interlocking seam.

2.02 ACCESSORIES

- A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.
- B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or puddle welds. See drawings for requirements.
- C. Side-Lap Fasteners: Verco PunchLok, ASC Delta Grip, or accepted equivalent. See plans for requirements.
- D. Flexible Closure Strips: Paintable vulcanized, closed-cell, synthetic rubber, or neoprene.
- E. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi, not less than 0.0359-inch design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.
- F. Column Closures, End Closures, Z-Closures, and Cover Plates: Steel sheet, of same material, finish, and thickness as deck, unless otherwise indicated.
- G. Galvanizing Repair Paint: ASTM A780/A780M, SSPC-Paint 20 or DOD-P-21035, with dry film containing a minimum of 94 percent zinc dust by weight.
- H. Repair Paint: Manufacturer's standard rust-inhibitive primer of same color as primer.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance.

3.02 INSTALLATION, GENERAL

- A. Install deck panels and accessories according to applicable specifications and commentary in SDI "Manual of Construction with Steel Deck (MOC3)", manufacturer's written instructions, and requirements in this Section.
- B. Install temporary shoring before placing deck panels, if required to meet deflection limitations.
- C. Locate deck bundles to prevent overloading of supporting members.
- D. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.
- E. Place deck panels flat and square and fasten to supporting frame without warp or deflection.
- F. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.
- G. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.
- H. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.
- I. See drawings for the required fastening type, size, spacing, configuration, etc.

3.03 ROOF-DECK INSTALLATION

- A. Fasten roof-deck panels to steel supporting members: See drawings for type, size, spacing, configuration etc. of connectors.
- B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports as required on drawings.
- C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 2-inches, with end joints as follows:
 - 1. End Joints: Lapped 2-inches minimum.
- D. Miscellaneous Roof-Deck Accessories: Install ridge and valley plates, finish strips, end closures, and reinforcing channels according to deck manufacturer's written instructions. Weld or mechanically fasten to substrate to provide a complete deck installation. Weld cover plates at changes in direction of roof-deck panels, unless otherwise indicated.
- E. Flexible Closure Strips: Install flexible closure strips over partitions, walls, and where indicated. Install with adhesive according to manufacturer's written instructions to ensure complete closure.

3.04 FIELD QUALITY CONTROL

- A. Field welds and other deck fastening will be subject to inspection by the Special Inspector hired by the Contractor.
- B. Special Inspector will report inspection results promptly and in writing to Contractor and Contracting Officer.

February 27, 2026

- C. Remove and replace work that does not comply with specified requirements.
- D. Additional inspecting, at Contractor's expense, will be performed to determine compliance of corrected work with specified requirements.

3.05 REPAIRS AND PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A780/A780M and manufacturer's written instructions.
- B. Provide final protection and maintain conditions to ensure that steel deck is without damage or deterioration at time of project acceptance.

END OF SECTION

SECTION 05720 - GUARDRAILS AND HANDRAILS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Galvanized steel railings and handrails
2. Miscellaneous attachments, anchors, and fasteners as indicated on the drawings or as required to conform to 2018 IBC as amended.

B. Related Sections include the following:

1. Section 03300 – CAST-IN-PLACE CONCRETE

1.02 CODES AND STANDARDS

A. In addition to referenced codes and standards within this specification, the work shall comply with the latest edition of the following standards. When conflicts arise between standards, the more stringent shall apply:

B. American Society for Testing and Materials (ASTM) Publications:

1. ASTM A 29 Standard Specification for General Requirements for Steel Bars, Carbon and Alloy, Hot-Wrought
2. ASTM A 36 Standard Specification for Carbon Steel.
3. ASTM A 53 Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
4. ASTM A 123 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
5. ASTM A 153 Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
6. ASTM A 269 Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
7. ASTM A 500 Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
8. ASTM A 653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
9. ASTM B 633 Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel.
10. ASTM D 1187 Specification for Asphalt Base Emulsions for Use as Protective Coatings for Metal.
11. ASTM E 488 Standard Test Methods for Strength of Anchors in Concrete Elements.
12. ASTM E 894 Standard Test Method for Anchorage of Permanent Metal Railing Systems and Rails for Buildings.

February 27, 2026

- 13. ASTM E 935 Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings.
- C. American Welding Society
 - 1. AWS D1.1 - Structural Welding Code, Steel
 - 2. AWS D1.6 - Structural Welding Code, Stainless Steel
- D. NAAMM Metal Finishes Manual; National Association of Architectural Metal Manufacturers.
- E. NOMMA National Ornamental and Miscellaneous Metals Association.

1.03 QUALITY ASSURANCE

- A. Product Options: Information on Drawings and in Specifications establishes requirements for system's aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including structural analysis, preconstruction testing, field testing, and in-service performance.
 - 1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
- B. Fabricator Qualifications: Firm with five years' experience in successfully producing metal guardrails and handrails similar to those indicated for this Project and with sufficient production capacity to produce required units without delaying the Work.
- C. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication, where possible. Do not delay job progress; allow for trimming and fitting where taking field measurements before fabrication might delay work.
- D. Installer Qualifications: Arrange for metal guardrails and handrails specified in this Section to be fabricated and installed by the same firm.
- E. For each type of guardrail and handrail system, all component and fittings for that system shall be furnished by the same manufacturer.
- F. Shop Assembly: Pre-assemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- G. Qualifications of Welders: Only welders certified in the arc welding process shall perform work in connection with the work in this Section.

1.04 SUBMITTALS

- A. Submit under the provisions of Section 01330 - SUBMITTAL PROCEDURES.
- B. Manufacturer's Data: Submit manufacturers product data for all manufactured products. Include hard copy printed color charts for all materials exposed and requiring selection of finish color.

- C. Shop Drawings: Submit complete shop drawings of all railing and handrail work to the Architect for review and approval before fabrication. Detail all members, connections, and anchorage not specifically shown but which are required to complete the work.
- D. Structural Analysis: For each type of guardrail system, submit structural calculations showing that the guardrails meet the performance requirements set forth in this section. Calculation shall be stamped and signed by a practicing engineer licensed in the State of Hawaii.
- E. Material Safety Data Sheets (MSDS): Submit MSDS for all materials.
- F. Samples: Submit samples of the following in the quantity indicated:
 - 1. Three (3) 12-inch long bar in specified finish and color.
- G. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- H. Welder certificates signed by Contractor certifying that welders comply with requirements specified under the "Quality Assurance" Article Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience.

1.05 SYSTEM PERFORMANCES

- A. Delegated Design: Design railings, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. General: In engineering railings to withstand structural loads indicated, determine allowable design working stresses of railing materials based on the following:
 - 1. Steel: 72 percent of minimum yield strength.
- C. Structural Performance of Guardrails and Railings: Provide handrails and railings capable of withstanding structural loads required by the 2018 International Building Code as amended and ASTM E 985 but not less than the following structural loads without exceeding allowable design working stress of materials for handrails, railings, anchors, and connections based on testing performed in accordance with ASTM E 894 and ASTM E 935:
 - 1. Top Rail of Guards: Capable of withstanding the following loads applied as indicated:
 - a. Concentrated load of 200 pounds applied at any point and in any direction.
 - b. Uniform load of 50 pounds per linear foot applied in any direction.
 - c. Concentrated and uniform loads above need not be assumed to act concurrently.
 - 2. Handrails Not Serving as Top Rails: Capable of withstanding the following loads applied as indicated:
 - a. Concentrated load of 200 pounds applied at any point and in any direction.

February 27, 2026

- b. Uniform load of 50 pounds per linear foot applied in any direction.
 - c. Concentrated and uniform loads above need not be assumed to act concurrently.
- 3. Intermediate Rails and Infill Area of Guards: Capable of withstanding a horizontal concentrated load of 50 pounds applied to 1 square foot at any point in system, including intermediate rails, balusters, or other elements composing infill area.
 - a. Load above need not be assumed to act concurrently with loads on top rails in determining stress on guard.
- D. Thermal Movements: Provide handrails and railings that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change (Range): 40 degrees F, ambient; 120 degrees F, material surfaces.
- E. Wind Loads: Design guardrails to withstand wind load design pressures, as indicated in the Cladding Wind Load Study written by RWDI, dated 04/30/2020 and as determined by Chapter 6 of ASCE/SEI 7 "Minimum Design Loads for Buildings and Other Structures."
 - a. Exposure Category: Exposure C
 - b. Ultimate Design Wind Speed: 168 mph
 - c. Importance Factor: 1.5
- F. Seismic Design Criteria: As determined by 2018 IBC and indicated on the Structural Drawings

1.06 PRODUCT HANDLING

- A. Protection: The Contractor shall use all means necessary to protect metal handrail and railing work before, during and after installation and to protect the installed work and materials of all other trades.
- B. Replacement: In the event of damage, the Contractor shall immediately make all repairs and replacements necessary to the satisfaction of the Architect and at no additional cost to the Owner.

1.07 COORDINATION AND SCHEDULING

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

February 27, 2026

- C. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not suit structural performance requirements.

1.08 PROJECT CONDITIONS

- A. Field Measurements: Where railing systems are indicated to fit to other construction, check actual dimensions of other construction by accurate field measurements before fabrication, show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Where field measurements cannot be made without delaying the Work, General Contractor will guarantee dimensions and railing fabricator will proceed with fabricating guardrails and handrails without field measurements. General Contractor will coordinate construction to ensure that actual dimensions correspond to guaranteed dimensions.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. General:
 - 1. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.
 - 2. Brackets, Flanges, and Anchors: Same metal and finish as supported rails unless otherwise indicated.
 - a. Provide formed stainless steel brackets with predrilled hole for bolted anchorage and with snap-on cover that matches bracket finish and conceals bracket base and bolt heads.

- B. Steel and Iron

- 1. Tubing: ASTM A 500 (cold formed) or ASTM A 513.
 - 2. Bars: Hot-rolled, carbon steel complying with ASTM A 29, Grade 1010.
 - 3. Castings, Brass: Sand castings complying with ASTM B 584, Alloy UNS No. C85200 (high-copper yellow brass).
 - 4. Plate, Sheet, Strip, and Bars; Brass: ASTM B 36, Alloy UNS No. C26000 (cartridge brass, 70 percent copper).

2.02 STEEL:

- A. Steel Plates, Shapes, and Bars: ASTM A 36
- B. Steel Tubing: Cold Formed steel tubing complying with ASTM A 500.
- C. Steel Pipe: ASTM A 53, standard weight (Schedule 40), unless another weight is indicated or require by structural loads.
- D. Galvanized Steel: ASTM A 653, G 90 coating.

2.03 WELDING MATERIALS, FASTENERS, AND ANCHORS

- A. Welding Electrodes and Filler Metal: Provide type and alloy of filler metal and electrodes as recommended by producer of metal to be welded, complying with applicable AWS specifications, and as required for color match, strength, and compatibility in fabricated items.
- B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of the type, grade, and class required to produce connections that are suitable for anchoring railings to other types of construction indicated and capable of withstanding design loadings.
- C. Fasteners for Interconnecting Railing Components: Use fasteners of same basic metal as the fastened metal, unless otherwise indicated. Do not use metals which are corrosive or incompatible with materials joined.
 - 1. Provide concealed fasteners for interconnection of handrail and railing components and for their attachment to other work, except where otherwise indicated.
- D. Fastener Materials: Unless otherwise indicated, provide the following:
 - 1. Galvanized-Steel Components: Plated-steel fasteners complying with ASTM B 633, Class Fe/Zn 25 for electrodeposited zinc coating.
 - 2. Dissimilar Metals: Type 316 stainless-steel fasteners.
- E. Anchors and Inserts: Provide anchors of type, size as indicated in the Drawings, fabricated from corrosion-resistant materials, capable of sustaining without failure, a load equal to 6 times the load imposed when installed in unit masonry and equal 4 times the load imposed when installed in concrete, as determined by testing per ASTM E 488, conducted by a qualified, independent testing agency. Use expansion bolt devices for drilled-in-place anchors.

2.04 GROUT AND ANCHORING CEMENT

- A. Non-shrink Nonmetallic Grout: Pre-mixed, factory-packaged, non-staining, noncorrosive, nongaseous, water-resistant grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications of type specified in this section.
 - 1. Products: Subject to compliance with the requirements, provide one of the following: (Select appropriate product for materials anchoring.)
 - a. MasterFlow 110AN; Master Builders Solutions by BASF.
 - b. Non-Shrink Precision Grout 1585; Quickrete
 - c. Non-Shrink Construction Grout; Sakrete
 - d. Or approved equal

2.05 MISCELLANEOUS MATERIALS

- A. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.
- B. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

2.06 FABRICATION

- A. General: Fabricate handrails and railing systems to design, dimensions and details shown. Provide handrail and railing members in sizes and profiles indicated, with supporting posts and brackets of size and spacing shown, but not less than required to comply with requirements indicated for structural performance.
 - 1. The materials shall be fabricated as indicated on the contract drawings and as specified herein unless indicated otherwise by ADAAG Section 505 requirements. Where there is a discrepancy between the contract documents and ADAAG requirements, the Contractor shall immediately notify the Architect for direction, clarification and/or corrective measures. Standard products of manufacturers specializing in similar work will be considered insofar as they fulfill the requirements and do not violate governing codes for building and standards of good construction work.
- B. Machine joint edges smooth and plane to produce hairline seams when site assembled; supply concealed sleeve connectors for joints.
- C. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- D. Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain profile of member throughout entire bend without buckling, twisting, or otherwise deforming exposed surfaces of handrail and railing components.
- E. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove flux immediately.
 - 4. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 1 welds: no evidence of a welded joint.
- F. Nonwelded Connections: Fabricate railing systems and handrails for interconnection of members by means of railing manufacturer's standard concealed mechanical fasteners and fittings unless otherwise indicated. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.
 - 1. Fabricate splice joints for field connection using epoxy structural adhesive where this represents manufacturer's standard splicing method.
 - 2. Fabricate joints that will be exposed to weather in a manner to exclude water.
- G. Brackets, Flanges, Fittings, and Anchors: Provide manufacturer's standard wall brackets, flanges, miscellaneous fittings, and anchors for interconnection of handrail and railing members to other work, unless otherwise indicated.

- H. Furnish inserts and other anchorage devices for connecting handrails and railing systems to concrete or masonry work. Fabricate anchorage devices which are capable of withstanding loadings imposed by handrails and railing systems. Coordinate anchorage devices with supporting structure.
- I. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items
- J. Provide wall returns at ends of wall-mounted handrails, unless otherwise indicated. Close ends of returns, unless clearance between end of rail and wall is 1/4 inch or less.
- K. Provide weep holes, or another means to evacuate entrapped water in hollow sections of railing members that are exposed to exterior or to moisture from condensation or other sources. Fill voids below weep level with self-leveling sealant or other appropriate fill material to assure no water penetration in the cored concrete and utility of weep holes.
- L. Fabricate joints that will be exposed to weather in a manner to exclude water.
- M. Use materials of size and thickness shown or, if not shown, of required size and thickness to produce strength and durability in finished product. Work to dimensions shown or accepted on shop drawings, using proven details of fabrication and support. Use type of materials shown or specified for various components of work.
- N. Miscellaneous Framing and Supports:
 - 1. Provide miscellaneous framing and supports as required to complete railing, guardrail and handrail work.
 - 2. Fabricate miscellaneous units to sizes, shapes and profiles shown or, if not shown, of required dimensions to receive adjacent other work to be retained by framing. Cut, drill and tap units to receive hardware and similar items.

2.07 GALVANIZED RAILING COMPONENTS

- A. Galvanizing:
 - 1. Hot-dip galvanize indicated steel and iron railings, including hardware, after fabrication.
 - 2. Comply with ASTM A 123/A 123M for hot-dip galvanized railings.
 - 3. Comply with ASTM A 153/A 153M for hot-dip galvanized hardware.
 - 4. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
 - 5. Fill vent and drain holes that are exposed in the finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.
- B. For galvanized railings, provide hot-dip galvanized fittings, brackets, fasteners, sleeves, and other ferrous components.
- C. Galvanized Steel Finish: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

February 27, 2026

1. Surface Preparation: Clean surfaces with nonpetroleum solvent so surfaces are free of oil and other contaminants. After cleaning, apply a zinc-phosphate conversion coating suited to the organic coating to be applied over it. Clean welds, mechanical connections, and abraded areas and repair galvanizing to comply with ASTM A 780.
2. Powder Coating: Immediately after cleaning and pretreating, apply 2-coat finish consisting of zinc-rich epoxy prime coat and TGIC polyester topcoat, with a minimum dry film thickness of 2 mils (0.05 mm) for topcoat. Comply with coating manufacturer's written instructions to achieve a minimum total dry film thickness of 4 mils.
 - a. Minimum hardness measured in accordance with ASTM D3363: 2H.
 - b. Direct impact resistance tested in accordance with ASTM D2794. Withstand 160 inch-pounds.
 - c. Salt spray resistance tested in accordance with ASTM B117: No undercutting, rusting, or blistering after 500 hours in 5 percent salt spray at 95 degrees F and 95 percent relative humidity and after 1000 hours less than 3/16- inch undercutting.
 - d. Weatherability tested in accordance with ASTM D822: No film failure and 88 percent gloss retention after 1 year exposure in South Florida with test panels tilted at 45 degrees.
 - e. Color: As selected by architect.
- D. Preparing Galvanized Railings for Field Painting: Thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with etching cleaner.
- E. Field Painting: Paint galvanized railings with paint system specified in Section 09900 – PAINTING under the heading "Primed and Unprimed Ferrous Metal"

PART 3 - EXECUTION

3.01 PREPARATION

- A. Coordinate setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, such as sleeves, concrete inserts, anchor bolts, and miscellaneous items having integral anchors, which are to be embedded in concrete as masonry construction. Coordinate delivery of such items to project site.
- B. Prior to all work of this Section, the Contractor shall carefully inspect the installed work of all other trades and verify that all such work is complete to the point where fabrication and installation of the work of this Section may properly commence.
- C. The Contractors shall make all required measurements in the field to ensure proper and adequate fit of all metal handrail and railing items.
- D. Examine the areas and conditions under which metal handrail and railing items will be installed and correct conditions detrimental to the proper and timely completion of the work. Do not proceed until unsatisfactory conditions have been corrected and approved by the Architect.

3.02 INSTALLATION, GENERAL

- A. Install guardrail systems in accordance with manufacturer's recommended installation instructions and approved shop drawings.
- B. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing railings and handrails to in-place construction; which will develop anchorage meeting or exceeding all system performance requirements.
- C. Fit exposed connections accurately together to form tight, hairline joints.
- D. Cutting, Fitting and Placement: Perform cutting, drilling, and fitting required for installation of railings and handrails. Set work accurately in location, alignment and elevation, plumb, level, true and free of rack, measured from established lines and levels.
 - 1. Do not weld or abrade surfaces of handrails and railing components that have been coated or finished after fabrication and are intended for field connection by mechanical or other means without further cutting or fitting.
 - 2. Set posts plumb within a tolerance of 1/4" inch in 12 feet.
 - 3. Align rails so that variations from level for horizontal members, parallel for aligned members, and rake for steps, ramps, and sloped members shall not exceed 1/4-inch in 12-feet.
- E. Field Welding: Comply with the following requirements:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing, and welded surface match contours of adjoining surfaces.
- F. Corrosion Protection: Coat concealed surfaces of aluminum, which will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint or zinc chromate primer.
- G. Adjust handrails and railing systems prior to anchoring to ensure matching alignment at abutting joints. Space posts at interval indicated but not less than that required by design loadings.

3.03 RAILING CONNECTIONS

- A. Non-welded Connections: Use manufacturer's standard mechanical or adhesive joints for permanently connecting railing components. Use wood blocks and padding to prevent damage to railing members and fittings. Seal recessed holes of exposed locking screws using plastic filler cement colored to match finish of handrails and railing systems.
- B. Welded Connections: Use fully welded joints for permanently connecting railing components by welding. Cope or butt components to provide 100 percent contact or use manufacturer's standard fittings designed for this purpose.

- C. Expansion Joints: Install expansion joints at locations indicated but not further apart than required to accommodate thermal movement. Provide slip joint internal sleeve extending 2 inches beyond joint on either side; fasten internal sleeve securely to one side; locate joint within 6 inches of post.

3.04 ANCHORING POSTS

- A. Concrete-Anchored Posts in Core-Drilled Holes: Core-drill concrete to produce holes with diameter at least 3/4" larger than outside dimensions of post and not less than the depths indicated required by the structural analysis and on the drawing for each type of railing. Clean holes of all loose material, insert posts, and fill annular space between post and concrete with non-shrink, nonmetallic grout, mixed and placed to comply with grout manufacturer's directions.
 - 1. Cover anchorage joint with flange of same metal as post. attached to post with set screws.
- B. Leave anchorage joint exposed; wipe off excess grout and leave 1/8" build-up, sloped away from post. For installation exposed on exterior or to flow of water, seal grout to comply with grout manufacturer's directions.

3.05 ATTACHING HANDRAILS TO WALLS

- A. Attach handrail to walls with wall brackets and end fittings. Provide bracket with 1-1/2-inch clearance from inside face of handrail to finished wall.
- B. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.
- C. Secure wall brackets and wall return fittings to building construction as follows:
 - 1. For concrete and solid masonry anchorage, use drilled-in expansion shield and either concealed hanger bolt or exposed lag bolt, as applicable.
 - 2. For hollow masonry anchorage, use toggle bolts with square heads.
 - 3. For concrete and solid masonry anchorage, use drilled-in expansion shield and either concealed hanger bolt or exposed lag bolt, as applicable.

3.06 ADJUSTING AND CLEANUP

- A. Touch-Up Painting: Cleaning and touch-up painting of field welds, bolted connections, and abraded areas of shop paint is specified in Division 9 of these specifications.
- B. For galvanized surfaces: Clean field welds, bolted connections, and abraded areas and apply galvanizing repair paint to comply with ASTM A 780.

3.07 PROTECTION

- A. Protect finishes of railing systems and handrails from damage during construction period by use of temporary protective coverings approved by railing manufacturer. Remove protective covering at time of Substantial Completion.
- B. Restore finishes damaged during installation and construction period so that no evidence remains of correction work. Return items which cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units as required.

February 27, 2026

3.08 CLEAN UP

- A. After installation, all surfaces shall be cleaned and ready to receive final treatment. All unused materials, tools and equipment shall be removed from the project site.
- B. From time to time, and as directed by the Architect and at the completion of the work, all rubbish, debris, fines, etc., accumulated from the work of this Section shall be removed from the project site and the area left neat and clean to the satisfaction of the Architect.

END OF SECTION

February 27, 2026

DIVISION 6 - WOOD AND PLASTICS

SECTION 06070 - WOOD TREATMENT

PART 1- GENERAL

1.01 SUMMARY

- A. Plant preservative and insecticide treatment of lumber and other wood products specified in other Sections of this Specification by pressure and dip methods.
- B. Field treatment of field cut or drilled lumber.

1.02 RELATED SECTIONS

- A. SECTION 06100 - ROUGH CARPENTRY: Lumber products needed to receive preservative and insecticide treatment of lumber products.

1.03 REFERENCES

- A. American Wood-Preservers' Association
 - 1. AWPA P5: Standard for Waterborne Preservatives.
 - 2. AWPA P9: Standards for Solvents and Formulations for Organic Preservative Systems.
 - 3. AWPA U1: Use Category System: User Specification for Treated Wood.
 - 4. AWPA T1: Use Category System: Processing and Treatment Standard
 - 5. AWPA M4-02: Care of Preservative-Treated Wood Products.

1.04 SUBMITTALS

- A. Submit in accordance with SECTION 01330 – SUBMITTAL PROCEDURES.
- B. Product Data: Provide data on all treatment products, including field application instructions if applicable.
 - 1. Provide manufacturer's Material Safety Data Sheets on all products, and hazardous materials.
- C. Preserver Certifications:
 - 1. Provide a Certificate of Treatment showing compliance with these specifications for the following:
 - a. Kiln drying.
 - b. Method of treatment performed, including dip treatment.
- D. Contractor's Certification: Provide a certification letter stating that all wood used on this job including cuts and penetration were treated and coated with preservatives in compliance with requirements of this contract.
- E. Guaranty: Submit written guaranty as specified in paragraph entitled "WARRANTY" hereinbelow.

1.05 REGULATORY REQUIREMENTS

February 27, 2026

- A. Comply with State OSHL (Occupancy Safety and Health Law) and pollution controls regulations of the State Department of Health and EPA.

1.06 QUALITY ASSURANCE

- A. Treatment methods shall be approved by ICBO. Preservatives shall be EPA registered.
- B. Do not use preservatives containing arsenic or other EPA banned chemicals.
- C. Do not use Perma-Clear 65 or other zinc naphthanate and permethrin products.

1.07 DELIVERY STORAGE AND HANDLING

- A. Protect AWPA C31 inorganic boron treated wood from contact with the ground, rain or other sources of liquid water until permanent installation of covering construction.

1.08 WARRANTY

- A. The Contractor shall issue to the Owner a written warranty that he will replace all treated wood in new buildings and additions which is attacked by subterranean termites within a period of five (5) years from the Date of Substantial Completion (unless a longer period of time is standard with the manufacturer) up to a total cost of \$5,000.00 (unless higher amount standard with the manufacturer) or is attacked by dry wood termites or deteriorates due to dry rot within the first five years of the project acceptance date.

PART 2- PRODUCTS

2.01 GENERAL

- A. Mill lumber to finish size and shape prior to treating, and treat before assembly. Plywood may be treated in regular panel sizes.
- B. Mark each treated item with the treatment quality mark of an inspection agency approved by the American Lumber Standards Committee Board of Review.
 - 1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece, or omit marking and provide certificates of treatment compliance issued by inspection agency.

2.02 PRESSURE TREATMENT WITH WATER-BORNE PRESERVATIVES

- A. Treating Solutions:
 - 1. Copper azole, Type A (CBA-A).
 - 2. Inorganic boron (SBX).
- B. Treatment Methods:
 - 1. General:
 - a. All water-borne treatment methods require incising of lumber of nominal 2-inch thickness (1-1/2 inches actual dimension).
 - b. Choice of treatment method and conditions of use of each treating solution shall conform to the treatment schedule contained in Part 3.

February 27, 2026

2. CBA-A: Treatment methods, depth of penetration and treating solution retention shall conform to AWWA U1.
 3. SBX: Treatment method shall conform to AWWA U1. Treating solution retention shall be a minimum of 0.28 pounds per cubic foot (equivalent to 0.42 DOT).
- C. Drying:
1. Before Treatment:
 - a. CBA-A Treatment: Wood shall be air dried or kiln-dried before treatment to an average moisture content of 28 percent or less per AWWA standards.
 - b. SBX Treatment: Wood having a moisture content higher than 28 percent is acceptable when treating with SBX.
 2. After Treatment: All one-inch and 2-inch lumber and all plywood shall be dried to a moisture content of 19 percent or less after treatment.

2.03 PRESSURE TREATMENT WITH OIL-BORNE PRESERVATIVES

- A. Treating Solution:
1. 0.50 percent by weight chlorpyrifos, 0.75 percent by weight 3-iodo-2-propynyl butyl carbamate (IPBC). The solvent used in formulating the preservative solution shall meet the requirements of AWWA hydrocarbon solvent Type C, Standard P9, Paragraph 3.1.
 2. For interior application use low odor mineral spirits as solvent.
- B. Treatment Methods: Treated wood shall attain the following net retention requirements: 0.0175 pounds of Chlorpyrifos per cubic foot of wood, 0.035 pound of 3-iodo-2 propynyl butyl carbamate per cubic foot of wood.
- C. Drying:
1. Before Treatment: All wood treated with oil-borne preservatives shall be kiln-dried to an average moisture content of 12 percent to 15 percent per AWWA standards.
 2. After Treatment: Wood shall be thoroughly dried and virtually odor-free prior to installation.

2.04 PRESERVATION BY DIP TREATMENT

- A. Treating Solution:
1. Any of the Oil-Borne Preservatives listed above.
 2. A solution of one quart chlorpyrifos in 55 gallons of a 0.50 percent IPBC solution.
- B. Treatment Methods:
1. Immersion treat for a minimum period of 15 minutes. Hollow-core flush wood doors shall be immersion treated for a period of 5 minutes.
 2. Doors shall be treated after manufacture but, where applicable, before application of plastic laminate.

February 27, 2026

3. Do not incise lumber scheduled to be left unpainted or receive a clear finish.
- C. Drying After Treatment: Wood shall be thoroughly dried and virtually odor-free prior to installation.

2.05 FIELD TREATMENT

- A. Treatment Method: Treat in accordance with AWPA Standard M4 using two heavy brush coats of a treating solution.

PART 3 – EXECUTION

3.01 SCHEDULE OF TREATMENTS

- A. Species:
 1. Treat all wood species except all-heart redwood.
 2. All water-borne and oil-borne treatment solutions are applicable to douglas-fir and hem-fir species except for CBA-A treatment which is acceptable for hem-fir species only.
- B. Application:
 1. Pressure Treatment:
 - a. General: Unless otherwise stipulated, all lumber and plywood shall be pressure treated.
 - b. Hardwood flooring and exposed lumber 1-1/2 inch (net thickness) and over that will be unpainted or receive a clear finish shall be and pressure treated with oil-borne preservative. Do not incise lumber.
 - c. SBX treated wood shall not be used in areas exposed to direct precipitation (e.g. exterior deck subframing, trellises, fencing, etc.) unless painted or covered with a finish material. SBX treatment shall not be used for exposed exterior wood decking.
 2. Dip Treatment: All finish lumber under 1-1/2 inch net thickness (except hardwood flooring); doors (solid wood and solid-core flush wood doors); finish plywood; and mill work items, such as for cabinet work, shelving and similar wood work that will be exposed to view in the finished work.
 3. Field Cuts: Treat end cuts, notches and penetrations into treated lumber or plywood. Exception: Cuts and penetrations made in SBX treated wood 2-inches or less in nominal thickness need not be field treated.

END OF SECTION

SECTION 06100 - ROUGH CARPENTRY

PART 1 - GENERAL

1.01 SUMMARY

A. Work Includes:

1. Wood framing, furring, grounds, nailers, and blocking.
2. Metal framing anchors.

B. Related Work Described Elsewhere:

1. Section 06070 – WOOD TREATMENT
2. Section 06200 – FINISH CARPENTRY

1.02 REFERENCES

- A. American Plywood Association's "Design/Construction Guide, Residential and Commercial" (APA).
- B. U.S. Department of Commerce, National Institute of Standards and Technology.
PS 1 US Product Standard for Construction and Industrial Plywood.
PS 2 Performance Standard for Wood-Based Structural-Use Panels.
PS 20 American Softwood Lumber Standard (ASLS).
- C. American Society for Testing and Materials (ASTM).
- D. American Wood Preservers' Association's Standards (AWPA).
- E. International Building Code, 2018 Edition (IBC) as amended by County of Kauai.

1.03 DEFINITIONS

- A. Rough carpentry: Carpentry work not specified in other sections and not exposed, unless otherwise indicated.
- B. Exposed framing: Dimension lumber not concealed by other construction and indicated to receive a transparent finish.
- C. For purposes of this section, "Certified Well-Managed Forests" shall be determined by standards endorsed by the Forest Stewardship Council (FSC).

1.04 SUBMITTALS

A. Submit in Accordance with SECTION 01330 – SUBMITTAL PROCEDURES

1. Product data and ICBO evaluation reports: Engineered wood products, underlayments, insulating sheathing, air-infiltration barriers, metal framing anchors, and construction adhesives.
2. Material certificates: Dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use,

February 27, 2026

and design values approved by American Lumber Standard's Committee, ALSC, Board of Review.

3. Material test reports: Compliance of fire-retardant-treated wood with indicated requirements.

1.05 QUALITY ASSURANCE

A. Single-source responsibility:

1. Fire-retardant-treated wood products: Obtain each type of product from one source and by a single manufacturer.

B. Wood products: Bear grade stamp or trade mark as follows.

1. Dimension lumber: Grade stamped by an agency certified by the Board of Review of the American Lumber Standards Committee and manufactured in accordance with PS-20.
2. Plywood: Trademark of the American Plywood Association.

1.06 DELIVERY, STORAGE AND HANDLING

A. Observe manufacturer's instructions and precautions for the safe transportation, storage and handling of potentially harmful or hazardous materials.

B. Keep materials under cover and dry.

1. Protect from weather and contact with damp or wet surfaces.
2. Stack lumber, plywood and other panels; place spacers between each bundle to provide air circulation.
3. Provide for air circulation around stacks and under temporary coverings.

C. Pressure treated lumber and plywood: Place spacers between each bundle to provide air circulation.

PART 2 - PRODUCTS

2.01 LUMBER

A. General:

1. Asbestos Prohibition: No asbestos containing materials or equipment shall be used in this section. The Contractor shall ensure that all material and equipment incorporated in the project are asbestos-free.
2. Lumber standards: Comply with PS 20 and with applicable grading rules of inspection agencies certified by American Lumber Standards Committee's (ALSC) Board of Review.
 - a. WCLIB: West Coast Lumber Inspection Bureau.
 - b. WWPA: Western Wood Products Association.
3. Grade stamps:

February 27, 2026

- a. Factory-mark each piece of lumber with type, grade, mill and grading agency.
 - b. Exposed lumber: Apply grade stamps to ends or back of each piece of exposed lumber, or omit grade stamps and issue certificate of grade compliance from inspection agency.
4. Dimensions:
- a. Nominal sizes are indicated, except as shown by detail dimensions. Provide actual sizes as required by PS 20, for moisture content specified for each use.
 - b. Provide dressed lumber, S4S, unless otherwise indicated.
5. Seasoning: Provide seasoned lumber with 15% maximum moisture content at time of dressing, unless otherwise indicated.
- B. Framing Lumber:
1. Light Framing Lumber: 2 inches through 4 inches thick, less than 6 inches wide, such as studs, plates, blocking, rough bucks, furring, etc., provide Construction grade, Douglas Fir/Larch.
- C. Miscellaneous Lumber:
1. Wood for support or attachment of other work including bucks, nailers, blocking, furring, grounds, stripping and similar members.
 2. 15 percent maximum moisture content.
 3. Grade and Species: For dimension lumber sizes, provide No. 3 or Standard grade lumber per ALSC's NGRs of any species. For board-size lumber, provide No. 3 Common or Standard grade per WWPA of any species.

2.02 PLYWOOD

- A. Standards: Comply with U.S. Product Standard PS 1 for softwood plywood panels. Comply with APA "Performance Standard and Policies for Structural-Use Panels" for products not manufactured under PS 1. Factory-mark each construction panel with APA.
- B. Manufacture plywood panels with an exterior-type adhesive complying with ASTM D 2559 and containing no urea formaldehyde.
- C. Performance-rated panels: APA Performance-Rated Panels complying with indicated requirements where used for the following concealed applications.
1. Roof Sheathing at Standing Seam Metal Roof: 5/8-inch, Structural I, 5-ply. Exterior exposure durability classification 1. Span rating 32/16.
 2. Countertop Substrate: APA 3/4-inch, B-B Marine Grade, 4-foot by 8-foot plywood.

2.03 FASTENERS

- A. General: Provide fasteners of size and type indicated, that comply with requirements specified.

February 27, 2026

- B. Where rough carpentry work is exposed to weather, in ground contact, or in areas of high relative humidity, provide fasteners with hot-dip, zinc-coating per ASTM A153.
- C. Power-Driven Fasteners: NES NER-272
- D. Nails, Wire, Brads, and Staples: FS FF-N-105B.
- E. Wood Screws: ASME B18.6.1.
- F. Machine Screws: ASME B18.6.3
- G. Lag Bolts: ASME B18.2.1.
- H. Bolts: Steel bolts complying with ASTM A307, Grade A with ASTM A563 hex nuts and, where indicated, flat washers.
- I. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry assemblies and equal to four times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.
 - 1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
 - 2. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2.

2.04 METAL FRAMING ANCHORS

- A. General: Provide galvanized steel framing anchors of structural capacity, type, and size indicated, with allowable design loads as published by manufacturer that meet or exceed those indicated on the Structural Drawings.
- B. Basis-of-Design Product: Subject to compliance with requirements, provide products indicated on Drawings or comparable products by one of the following:
 - 1. Simpson Strong-Tie.
- C. Galvanized Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A653, G90 coating designation; structural, commercial, or lock-forming quality, as standard with manufacturer for type of anchor indicated.
 - 1. Use for all locations unless otherwise indicated.
- D. Stainless-Steel Sheet: ASTM A 666, Type 316.
 - 1. Use for exterior locations and where indicated.
- E. Top Flange Hangers: U-shaped joist hangers, full depth of joist, formed from metal strap with tabs bent to extend over and be fastened to supporting member.
 - 1. Strap Width: 2-inches
 - 2. Metal thickness: As required to meet structural loading and performance.

2.05 MISCELLANEOUS MATERIALS

February 27, 2026

- A. Building Paper: ASTM D 226, Type I, asphalt saturated felt, non-perforated, 30-lb type.
- B. Construction Adhesive: Formulation complying with ASTM D 3498 that is approved for use indicated by adhesive manufacturer.
 - 1. Use adhesive that have a VOC content of 70 g/L or less when calculated according to 40 CFR 59 subpart D (EPA METHOD 24)

PART 3 – EXECUTION

3.01 INSPECTION

- A. Examine areas to receive rough carpentry work and verify following:
 - 1. Complete installation of building components to receive rough carpentry work.
 - 2. That surfaces are satisfactory to receive work.
 - 3. That spacing, direction, and details of supports are correct to accommodate installation of blocking, backing, stripping, furring, and nailers.

3.02 INSTALLATION

- A. General:
 - 1. Discard material with defects which might impair quality of work, and units which are too small to use in fabricating work with minimum joints or optimum joint arrangement.
 - 2. Set carpentry work to required levels and lines, with members plumb and true to line and cut and fitted.
 - 3. Fit rough carpentry to other construction; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds, and similar supports to allow attachment of other construction.
 - 4. Apply field treatment complying with AWPA M4 to cut surfaces of preservative-treated lumber and plywood
 - 5. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
 - 6. Securely attach carpentry work to substrate by anchoring and fastening as shown and as required by the following:
 - a. IBC Table 2304.9.1, "Fastening Schedule."
 - b. Published requirements of the metal framing anchor manufacturer.
 - c. CABO NER-272 for power-driven fasteners.
 - 7. Countersink nail heads on exposed carpentry work. Fill holes.
 - 8. Use common wire nails, except as otherwise indicated. Use finishing nails for finish work. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make

February 27, 2026

tight connections between members. Install fasteners without splitting wood. Predrill as required.

9. At concealed connections, countersink bolts and screws as noted on drawings. Cover hole with wood plug. Species, color and grain as required to closely match main wood member.

B. Grounds, Nailers, Blocking and Sleepers:

1. Provide wherever shown and where required for screeding or attachment of other work. Form to shapes as shown and cut as required for true line and level of work to be attached. Coordinate location with other work involved.
2. Attach to substrates as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise indicated. Build into masonry during installation of masonry work. Where possible, anchor to formwork before concrete placement.

3.03 INSTALLATION OF CONSTRUCTION PANELS

- A. Comply with applicable recommendations contained in "APA Design/Construction Guide - Residential & Commercial," for types of construction panels and applications indicated.

B. Fastening methods:

1. Plywood backing panels: Nail to supports.

3.04 PROTECTION

- A. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION

SECTION 06160 - EXTERIOR GYPSUM SHEATHING

PART 1 -GENERAL

1.01 SUMMARY

- A. Section Includes: Fiberglass-mat faced, moisture resistant gypsum sheathing, and accessories indicated, specified, or required to complete installation.

1.02 DEFINITIONS

- A. Gypsum Board Construction Terminology Standard: ASTM C11 and Gypsum Association Publication GA 253 for definitions of terms for gypsum board construction not otherwise defined in this Section or other referenced standards.

1.03 CODES AND STANDARDS

- A. In addition to referenced codes and standards within this specification, the work shall comply with the latest edition of the following standards. When conflicts arise between standards, the more stringent shall apply.
 - 1. ASTM 1278, Standard Specification for Fiber-Reinforced Gypsum Panel
 - 2. ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products.
 - 3. ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
 - 4. ASTM E72 Standard Test Methods of Conducting Strength Tests of Panels for Building Construction.

1.04 SUBMITTALS

- A. Product Data: Manufacturer's technical literature for each product indicated, specified, or required.
- B. Installer Qualifications: Data for company, principal personnel, experience, and training specified in PART 1 "Quality Assurance" Article.
- C. Warranty: Copy of specified warranty.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company with not less than 10 years' experience in manufacturing products similar to scope of this Project with a record of successful in-service performance.
- B. Installer Qualifications: Company with not less than 5 years' experience in performing specified work similar in design, products, and extent to scope of this Project; with a record of successful in-service performance; and with sufficient production capability, facilities, and trained and skilled personnel.
- C. All shop and field materials as well as workmanship are subject to inspection by the Owner, Architect or Exterior Wall Consultant at all times. Such inspections

do not relieve the Exterior Wall Contractor from obligations to comply with all requirements of the Contract Documents.

1.06 DELEGATED ENGINEERING REQUIREMENTS

- A. Contract Documents: Concept of work specified by this Section is expressed on Drawings and in Specifications. However, they may not indicate or specify full extent of work that may be required.
- B. Delegated Engineering Responsibility: Gypsum Sheathing to withstand structural design loads within limits and under conditions indicated, specified, or required, without material failure or permanent deformation of building structural frame or work specified.
- C. Delegated Engineering Assumptions:
 - 1. Coordinate with Specification Section 05400 – COLD-FORMED METAL FRAMING.

1.07 PERFORMANCE REQUIREMENTS

- A. Building Structural Frame Movement Design Criteria: Obtain necessary projected data and make such provision in the work as may be necessary.
 - 1. Coordinate with Specification Section 05400 – COLD-FORMED METAL FRAMING.
- B. Wind Resistance Criteria: Withstand load effects of 150 percent (safety load) of inward positive and outward negative design wind load design pressures, as indicated in Contract Documents, acting inward and outward normal to plane of wall according to ASTM E 330.
 - 1. Net permanent deformation of structural members not more than 0.2 percent or L/1000.
 - 2. No failure or gross permanent distortion of framing members, anchors or connections, or any other portion of system.
 - 3. Not more than 1/8-inch movement in any direction or not more than 1/16-inch set after load is removed.
- C. Deflection Criteria:
 - 1. Deflection Perpendicular to Wall Plane: Net deflection of framing members supporting Exterior Gypsum Sheathing shall not exceed L/240.
 - 2. Delegated Engineering Quality Standards: AAMA TIR-A11.
- D. Thermal Movement Resistance Criteria:
 - 1. Withstand expansion and contraction movement of framing members and components without excessive thermal movement according to AAMA 501.5.
 - 2. Base calculations on actual surface temperatures due to both solar heat gain and nighttime sky heat loss.
 - a. Ambient Temperature Range: Plus 170 deg F to minus 10 deg F
 - b. Surface Temperature: 180 deg F.

February 27, 2026

E. Fire-Test-Response Characteristics:

1. Fire Rated Assembly Design:

- a. As required by code.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. General Requirements: Deliver, store and handle products to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.
- B. Store materials inside under cover and off of floor. Neatly stack gypsum sheathing boards flat on leveled supports off the ground under protective covering.
- C. Protect from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other effects causing damage or deterioration.
- D. Handle gypsum sheathing board to prevent damaging edges, ends, backs, or faces.

1.09 FIELD CONDITIONS

- A. Weather Condition Limitation: Proceed with work only when existing and forecasted weather conditions will permit installation according to manufacturers' instructions and warranty requirements, including, but not limited to, temperature, humidity, precipitation, and wind conditions are favorable.
1. Do not leave boards exposed to the weather for longer than 1 month.

1.10 WARRANTY

- A. Manufacturers Special Warranty: Furnish labor and material warranty to fully replace work and covering construction for a period of 5 years from date of substantial completion agreeing to repair or replace defective material, signed by an authorized representative using manufacturer's standard form.

PART 2 -PRODUCTS

2.01 PRODUCTS, GENERAL

- A. Single Source Responsibility: Furnish each type of product through one source from a single manufacturer.

2.02 MANUFACTURERS AND PRODUCTS

- A. Basis of Design: Contract Documents are based on manufacturer and product named below to establish a standard of quality. Other acceptable manufacturers with products having equivalent characteristics may be considered, provided deviations are minor and do not change concept as expressed in Contract Documents as judged by Exterior Wall Consultant through Architect.
1. Basis of Design Product Selections:
- a. Manufacturer: Georgia-Pacific Gypsum LLC

February 27, 2026

- b. Product: DensGlass Fiberglass-Mat Faced Gypsum Sheathing
- c. Quality Standard: ASTM C1177.
- d. Thickness: 5/8 in
- e. Surfacing: Coated fiberglass mat on face, back, and long edges.
- 2. (If required) Fire-Rated Fiberglass-Mat Faced Gypsum Sheathing: ASTM C1177, Type X:
 - a. Thickness: 5/8 inch.
 - b. Width: 4 feet.
 - c. Length: 8 feet.
 - d. Weight: 2500 pounds per M square feet.
 - e. Edges: Square.
 - f. Surfacing: Coated fiberglass mat on face, back, and long edges.
 - g. Racking Strength (Ultimate, not design value) (ASTM E72): Not less than 654 pounds per square foot, dry.
 - h. Flexural Strength, Parallel (ASTM C1177): 100 lbf, parallel.
 - i. Humidified Deflection (ASTM C1177): Not more than 1/8 inch.
 - j. Permeance (ASTM E96): Not more than 12 perms.
 - k. R-Value (ASTM C518): 0.67.
 - l. Acceptable Products:
 - i. 5/8-inch DensGlass Gold Fireguard, Georgia-Pacific Gypsum.

2.03 FASTENERS

- A. General: Screws as recommended by gypsum sheathing manufacturer.
- B. Quality Standard: ASTM C 1002 for steel framing substrates less than 0.03 in thick
- C. Quality Standard: ASTM C 954 for steel framing substrates from 0.033 in to 0.112 in thick
- D. Description: Type S steel drill screws, self-tapping, 1 in long, with corrosion protective coating having a salt-spray resistance of more than 800 hours per ASTM B117.

2.04 ACCESSORY MATERIALS

- A. Water-resistant barrier:
 - 1. As specified in Section 07241 – DIRECT-APPLIED EXTERIOR FINISH SYSTEM.
- B. Joint Tape:
 - 1. As required by Sheathing Manufacturer.

PART 3 -EXECUTION

3.01 EXAMINATION

A. Acceptance of Surfaces and Conditions:

1. Examine substrates to receive gypsum sheathing for compliance with requirements and other conditions affecting performance.
2. Proceed only when unsatisfactory conditions have been corrected in a manner complying with Contract Documents.
3. Starting work within a particular area will be construed as acceptance of surface conditions.

3.02 INSTALLATION

A. Installation Quality Standards: In addition to standards listed elsewhere, perform work according to following, unless otherwise specified:

1. ASTM C 1280
2. GA-253 Application of Gypsum Sheathing
3. Manufacturer's written installation instructions.
4. Approved submittals.
5. Contract Documents.

B. Vertical Installation:

1. Install plumb, level, true, located and in alignment with established lines and floor levels.
2. Allow for expansion and contraction movements due to thermal and building movement conditions.
 - a. Cut and space edges of gypsum sheathing to match spacing of structural support elements.
3. Mechanically support 4 edges of sheathing board over framing or substrate. Install board edge over flanges of steel studs.
 - a. Fasteners not more than 1 in from edges and not less than 3/8 in from the ends and edges of boards.
 - b. Fasteners spaced approximately 8 in on center.
 - c. Cut boards at penetrations and other obstructions of the work. Seal all holes and fasteners penetrations.
4. Fit tightly against abutting construction, except provide a 3/8 in sealant joint where non-load-bearing construction abuts structural elements.
5. Do not countersink fasteners. Apply fasteners so that screw heads bear tightly against face of gypsum sheathing boards.

3.03 WATER-RESISTANT BARRIERS

A. As specified in Section 07241 – DIRECT-APPLIED EXTERIOR FINISH SYSTEM.

February 27, 2026

3.04 PROTECTION

- A. Protect gypsum sheathing from damage and excessive weathering until installation of overlying materials. Repair damaged material.

END OF SECTION

SECTION 06200 - FINISH CARPENTRY

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes: Provide all finish carpentry work, complete, including, but not limited to, the following items.
 - 1. All finish carpentry work, blocking, etc.
 - 2. Wood trim.
 - 3. Millwork.
 - 4. Rough hardware.
- B. Related Work Specified Elsewhere:
 - 1. Section 06070 – WOOD TREATMENT - Preservative treatment.
 - 2. Section 06100 - ROUGH CARPENTRY - Wood blocking and concealed framing.
 - 3. Section 09900 - PAINTING.
- C. Definition: For purposes of this section, "Certified Well-Managed Forests" shall be determined by standards endorsed by the Forest Stewardship Council (FSC).

1.02 REFERENCES

- A. Architectural Woodwork Standards: 2009 AWI, AWMAC, WI – “Architectural Woodwork Standards, 1st Edition” (AWS).

1.03 QUALITY ASSURANCE

- A. Architectural Woodwork Standards: Unless otherwise indicated, comply with 2009 AWI, AWMAC, WI – “Architectural Woodwork Standards, 1st Edition” for grades of interior architectural woodwork indicated for construction, finishes, installation, and other requirements.
- B. Grading Marks: Factory mark each piece of lumber and plywood with type, grade, mill, and grading agency identification. Certificate of inspection and grading by a recognized agency may be submitted with each shipment in lieu of factory marking, at Contractor’s option.
- C. Softwood Lumber Standards: Comply with U.S. Department of Commerce PS 20 and with applicable grading rules of the respective grading and inspection agency for the species and product indicated.
- D. Hardwood Lumber Standard: Comply with National Hardwood Lumber Association (NHLA) rules.
- E. Plywood Standards: Comply with U.S. Department of Commerce PSI for softwood plywood; PS 51 for hardwood plywood.
 - 1. Manufacture plywood panels with an exterior-type adhesive complying with ASTM D 2559 and containing no urea formaldehyde.

February 27, 2026

- F. Qualifications of Manufacturer: Millwork used in work of this section shall be produced by manufacturers or custom millwork shops regularly engaged in manufacturing of similar items and with a minimum 5 year history of successful production acceptable to the Architect.
- G. Qualifications of Installers: Use adequate number of skilled workmen who are thoroughly trained and experienced in necessary crafts and who are completely familiar with specified requirements and methods needed for proper performance of work of this section.

1.04 SUBMITTALS

- A. Submit under the provisions of Section 01330 - SUBMITTAL PROCEDURES.
- B. Product Data: Submit descriptive data which provides narrative written verification of all types of construction materials and finishes, methods of construction, etc. not clearly illustrated on the submitted shop drawings. Data shall provide written verification of conformance with AWI Quality Standards for the quality indicated to include materials, tolerances, and types of construction.
- C. Manufacturer's Data: For each type of process and factory-fabricated product. Indicate component materials, dimensions, profiles, textures, and colors and include construction and application details.
- D. Shop Drawings: Submit shop drawings showing all fabricated millwork and casework items in plan view, elevations and cross-sections to accurately indicate materials used, details of construction, dimensions, methods of fastening and erection, and installation methods proposed.
 - 1. Shop drawing millwork items shall be clearly cross-referenced to millwork items located on the project drawings.
 - 2. Shop drawings shall include a color schedule of all millwork items to include all, exposed, and semi-exposed millwork finishes including finish material manufacturer, pattern, and color
 - 3. Submit shop drawings for the following:
 - a. Millwork.
 - b. Standing and Running Trims
- E. Samples: Submit samples of the following:
 - 1. Hardwood trim (provide half of each piece with finish as specified under Section 09900 - PAINTING).
- F. Certificates: Provide a certificate of treatment showing compliance with the specifications, and a certificate of dryness for all wood specified to be dried after treatment.
- G. Material Safety Data Sheet (MSDS): Submit MSDS for each material.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Protect finish carpentry products with appropriate heavy duty wrapping materials prior to shipment. Mark each unit with appropriate identification required for installation.

February 27, 2026

- B. Protect finish carpentry materials during transit, delivery, storage and handling to prevent damage, soiling and deterioration.
- C. Do not deliver finish carpentry materials, until painting, wet work, grinding and similar operations which could damage, soil or deteriorate woodwork have been completed in installation areas. If, due to unforeseen circumstances, finish carpentry materials must be stored in other than installation areas, store only in areas meeting requirements specified for installation areas.
- D. Store materials away from threat of termite or other insect infestation.

1.06 PROJECT CONDITIONS

- A. Field measurements: Where millwork are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed, and indicate measurements on Shop Drawings.
- B. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating millwork without field measurements. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.
- C. Environmental Requirements:
 - 1. Interior Finish Carpentry:
 - a. Do not install finish carpentry until required temperature and relative humidity have been stabilized and will be maintained in installation areas.
 - b. Condition spaces for a minimum of 48 hours within occupant usage temperature and humidity ranges during the remainder of work.

1.07 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior finish carpentry can be supported and installed as indicated.

PART 2 - PRODUCTS

2.01 WOOD PRODUCT QUALITY STANDARDS

- A. Softwood Lumber Standards: Comply with U.S. Department of Commerce PS 20 and with applicable grading rules of the respective grading and inspection agency for the species and product indicated.
- B. Hardwood Lumber Standard: Comply with National Hardwood Lumber Association (NHLA) rules.
- C. Plywood Standards: Comply with U.S. Department of Commerce PSI for softwood plywood; PS 51 for hardwood plywood.

- D. Architectural Woodwork Quality Standards: Comply with AWI Quality Standards, Guide Specifications and Quality Certification Program, latest edition or WIC Manual of Woodwork, latest edition.

2.02 MATERIALS

- A. General: All wood products used in this section shall originate in "Certified Well-Managed Forests".
 - 1. Nominal sizes are indicated, except as shown by detailed dimensions. Provide dressed or worked and dressed lumber, as applicable, manufactured to the actual sizes as required by PS 20 or to actual sizes and pattern as shown, unless otherwise indicated.
 - 2. Moisture Content of Softwood Lumber: Provide kiln-dried lumber having a moisture content from time of manufacture until time of installation not greater than values required by the applicable grading rules of the respective grading and inspecting agency for the species and product indicated.
 - 3. Moisture Content of Hardwood Lumber: Provide kiln-dried lumber having a moisture content from time of manufacture until time of installation within a range of 8% to 13% for individual pieces, and an average of 11% for the entire lot.
 - 4. Solid lumber stock: Comply with AWI Quality Standard Section 100 Lumber grading rules.
 - a. Softwood for concealed casework structures and supports: Custom Grade, western pine.
 - 5. Plywood
 - a. Softwood plywood for concealed structures and supports: AWI Section 200-2, Custom Grade; species as selected.
 - b. Manufacture plywood panels with an exterior-type adhesive complying with ASTM D 2559 and containing no urea formaldehyde.
- B. Interior Finish Carpentry
 - 1. Grade: AWI Custom
 - 2. Solid lumber shall be milled to profiles indicated on the Drawings. No. finger jointing allowed
 - a. Gluing for width is allowed for boards and trims wider than 6-inches
 - 3. Standing Trims: Fabricated from solid hardwood lumber, FAS, kiln dried, milled to profiles indicated on the Drawings of following species
 - a. For Painted Finish: Poplar or Birch.
 - b. For Transparent/stained Finish: Maple, Plain Sawn where scheduled and indicated on the Drawings to match Kensington Maple Laminate.
- C. Fasteners and Anchorages: Provide nails, screws and other anchoring devices of the proper type, size, material and finish for application indicated to provide secure attachment, concealed where possible, and complying with applicable ANSI specification. Provide all fasteners and anchorages with a hot-dipped zinc coating (ASTM A 153). Fasteners at wet areas shall be stainless steel.

February 27, 2026

D. Adhesives:

1. Aliphatic-resin, polyurethane, or resorcinol wood glue recommended by manufacturer for general carpentry use.
2. Multipurpose Construction Adhesive: Formulation complying with ASTM D 3498 that is recommended for indicated use by adhesive manufacturer.
3. Resilient Molding Adhesive: Brush-on, roll-on, or trowel on water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.
 - a. Adhesive shall be solvent free with zero VOC content, low odor , no ammonia and non-flammable in wet state.

E. Fasteners and Anchorages: Provide nails, screws and other anchoring devices of the proper type, size, material and finish for application indicated to provide secure attachment, concealed where possible, and complying with applicable ANSI specification. Provide all fasteners and anchorages with a hot-dipped zinc coating (ASTM A 153). Fasteners at wet areas shall be stainless steel.

1. For Ipe wood decking use #8 x 3-inch, Type 316 Stainless Steel deck screws

F. Wood Treatment: Treat lumber in accordance with Section 06070 – WOOD TREATMENT.

G. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.03 FABRICATION

- A. Millwork shall be fabricated at the mill shop in accordance with detailed drawings, in as large units as practicable for shipment and introduction into permanent position in an orderly arrangement for neat and rigid field assembly. All units when erected in place shall be straight, square, plumb, level and free from damage and tool marks. All joints shall be made up with waterproof glue. Nails and screws shall be placed in concealed surfaces to the maximum extent possible. Particleboard core shall not be used.

2.04 FINISHING

- A. Wood Scheduled for Paint finish: Leave in paint ready condition to be field finished in accordance to Section 09900 – PAINTING.

PART 3 - EXECUTION

3.01 EXAMINATION AND PREPARATION

- A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Examine finish carpentry materials before installation. Reject materials that are wet, moisture damaged, and mold damaged.

February 27, 2026

- C. Clean substrates of projections and substances detrimental to application.
- D. Before installing interior finish carpentry, condition materials to average prevailing humidity in installation areas for a minimum of 24 hours.

3.02 INSTALLATION

- A. Discard units of material which are unsound, warped, bowed, twisted, improperly treated, not adequately seasoned or too small to fabricate work with minimum of joints or optimum jointing arrangements, or which are of defective manufacturer with respect to surfaces, sizes or patterns.
- B. Install the work plumb, level, true and straight with no distortions. Shim as required using concealed shims. Install to a tolerance of 1/16-inch maximum offset in flush adjoining 1/8-inch maximum offsets in revealed adjoining surfaces.
- C. Scribe and cut work to fit adjoining work, and refinish cut surfaces or repair damaged finish at cuts.
- D. Standing and Running Trim: Install with minimum number of joints possible, using full-length pieces (from maximum lengths of lumber available) to the greatest extent possible. Stagger joints in adjacent and related members. Cope at returns, miter at corners, to produce tight fitting joints with full surface contact throughout length of joint. Use scarf joints for end-to-end joints. Sand smooth for imperceptible joints. Make exterior joints water-resistant by careful fitting.
- E. All units when erected in place shall be straight, square, plumb, level and free from damage and tool marks. All joints shall be made up with waterproof glue.
- F. Nails and screws shall be placed in concealed surfaces to the maximum extent possible. Particleboard core shall not be used.
- G. Back out or kerf backs of the following members except those with ends exposed in finished work:
 - 1. Interior standing and running trim except shoe and crown molds.
- H. Ease edges of lumber less than 1 inch in nominal thickness to 1/16-inch radius and edges of lumber 1 inch or more in nominal thickness to 1/8-inch radius.
- I. Anchor finish carpentry work to anchorage devices or blocking built-in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and where prefinished matching fasteners heads are required, use fine finishing nail for exposed nailings, countersunk and filled flush with finished surface, and matching final finish where transparent finish is indicated.
- J. Re-treat cut and penetrated lumber in accordance with Section 06070 - WOOD TREATMENT.

3.03 ADJUSTMENT, CLEANING, FINISHING AND PROTECTION

- A. Repair damaged and defective millwork wherever possible to eliminate defects functionally and visually; where not possible to repair properly, replace millwork. Adjust joinery for uniform appearance.
- B. Clean millwork on exposed and semi-exposed surfaces. Touch-up shop-applied finishes to restore damaged or soiled areas.

February 27, 2026

- C. Protection: Installer shall advise Contractor of procedures required to protect work during remainder of construction period to ensure that work will be without damage or deterioration at time of acceptance.

END OF SECTION

February 27, 2026

SECTION 06412 – ARCHITECTURAL CASEWORK

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes: Provide all architectural casework, complete, including, but not limited to the following items.
 - 1. Plastic Laminated Casework:
 - a. Wall and Base Cabinets
- B. Related Work Specified Elsewhere:
 - 1. Section 06070 - WOOD TREATMENT - Preservative treatment.
 - 2. Section 06100 - ROUGH CARPENTRY - Wood blocking and concealed framing.
 - 3. Section 06200 – FINISH CARPENTRY
 - 4. Section 06615 – SOLID SURFACE MATERIAL COUNTERTOPS
 - 5. Section 09900 – PAINTING

1.02 REFERENCES

- A. Architectural Woodwork Standards: 2014 AWI, AWMAC, WI – “Architectural Woodwork Standards, 2nd Edition” (AWS).
- B. Department of Justice’s 2010 ADA Standards for Accessible Design.

1.03 QUALITY ASSURANCE

- A. Architectural Woodwork Standards: Unless otherwise indicated, comply with 2014 AWI, AWMAC, WI – “Architectural Woodwork Standards, 2nd Edition” for grades of interior architectural woodwork indicated for construction, finishes, installation, and other requirements.
- B. Grading Marks: Factory mark each piece of lumber and plywood with type, grade, mill, and grading agency identification. Certificate of inspection and grading by a recognized agency may be submitted with each shipment in lieu of factory marking, at Contractor’s option.
- C. Softwood Lumber Standards: Comply with U.S. Department of Commerce PS 20 and with applicable grading rules of the respective grading and inspection agency for the species and product indicated.
- D. Hardwood Lumber Standard: Comply with National Hardwood Lumber Association (NHLA) rules.
- E. Plywood Standards: Comply with U.S. Department of Commerce PS 1 for softwood plywood; PS 51 for hardwood plywood.
- F. Fabricator Qualifications: Casework specified in this section shall be produced by a custom casework shop that employs skilled workers and that is regularly engaged in the manufacturing of similar items and with a minimum 5-year history of successful production acceptable to the Architect

February 27, 2026

- G. Installer Qualifications: Use only a firm which can demonstrate successful experience in installing items similar in type and quality to those specified for this project.
- H. Regulatory Requirements: Comply with applicable provisions in Department of Justice's 2010 ADA Standards for Accessible Design for cabinetry.

1.04 SUBMITTALS

- A. Submit under the provisions of Section 01330 - SUBMITTAL PROCEDURES.
- B. Product Data: Submit descriptive data which provides narrative written verification of all types of construction materials and finishes, methods of construction, etc. not clearly illustrated on the submitted shop drawings. Data shall provide written verification of conformance with AWS Quality Standards for the quality indicated to include materials, tolerances, and types of construction.
- C. Shop Drawings: Submit shop drawings showing all fabricated casework items in plan view, elevations and cross-sections to accurately indicate materials used, details of construction, dimensions, methods of fastening and erection, and installation methods proposed.
 - 1. Casework items shown in the Shop Drawings shall be clearly cross-referenced to Casework items indicated on the Project drawings.
 - 2. Shop drawings shall provide a color schedule of all millwork items to include all, exposed, and semi-exposed millwork finishes including finish material manufacturer, pattern, and color.
- D. Samples: Submit samples of the following:
 - 1. For each type of plastic laminate submit (3) 12-inch square samples.
 - 2. Exposed cabinet hardware, one unit of each type and finish.
 - 3. Cabinet liner.
- E. Certificates: Provide a certificate of treatment showing compliance with the specifications, and a certificate of dryness for all wood specified to be dried after treatment.
- F. Material Safety Data Sheet (MSDS): Submit MSDS for each material.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Protect finish carpentry materials during transit, delivery, storage and handling to prevent damage, soiling and deterioration.
- B. Protect casework during handling, transit and storage to prevent damage and deterioration. Store in a conditioned space complying with environmental requirements of this specification. Stack only in accordance with manufacturer's instructions.
- C. Do not deliver casework materials, until painting, wet work, grinding and similar operations which could damage, soil or deteriorate woodwork have been completed in installation areas. If, due to unforeseen circumstances, finish carpentry materials must be stored in other than installation areas, store only in areas meeting requirements specified for installation areas.

February 27, 2026

- D. Store materials away from threat of termite or other insect infestation.

1.06 PROJECT CONDITIONS

- A. Field measurements: Where casework is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed, and indicate measurements on Shop Drawings.
- B. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating woodwork without field measurements. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.
- C. Environmental requirements
 - 1. Do not install casework until required temperature and relative humidity have been stabilized and will be maintained in installation areas.
 - 2. Condition spaces for a minimum of 48 hours within occupant usage temperature and humidity ranges during the remainder of work.

1.07 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior architectural woodwork can be supported and installed as indicated

PART 2 - PRODUCTS

2.01 ASBESTOS PROHIBITION

- A. No asbestos containing materials or equipment shall be used in this section. The Contractor shall ensure that all materials and equipment incorporated in the project are asbestos-free.

2.02 WOOD PRODUCT QUALITY STANDARDS

- A. Softwood Lumber Standards: Comply with U.S. Department of Commerce PS 20 and with applicable grading rules of the respective grading and inspection agency for the species and product indicated.
- B. Hardwood Lumber Standard: Comply with National Hardwood Lumber Association (NHLA) rules.
- C. Plywood Standards: Comply with U.S. Department of Commerce PS 1 for softwood plywood; PS 51 for hardwood plywood.

February 27, 2026

- D. Architectural Woodwork Quality Standards: Comply with AWI Quality Standards, Guide Specifications and Quality Certification Program, latest edition or WIC Manual of Woodwork, latest edition.

2.03 MATERIALS

A. General:

1. Nominal sizes are indicated, except as shown by detailed dimensions. Provide dressed or worked and dressed lumber, as applicable, manufactured to the actual sizes as required by PS 20 or to actual sizes and pattern as shown, unless otherwise indicated.
2. Moisture Content of Softwood Lumber: Provide kiln-dried lumber having a moisture content from time of manufacture until time of installation not greater than values required by the applicable grading rules of the respective grading and inspecting agency for the species and product indicated.
3. Moisture Content of Hardwood Lumber: Provide kiln-dried lumber having moisture content from time of manufacture until time of installation within a range of 8% to 13% for individual pieces, and an average of 11% for the entire lot.

B. Solid lumber stock: Comply with AWS Section 3 - Lumber for grading rules.

1. Softwood for concealed structures and supports: Custom Grade, western pine.

C. Plywood

1. Softwood plywood for concealed structures and supports: AWS Section 4.2b, Grade A; Douglas Fir.
2. Veneer-Faced Panel Products (Hardwood Plywood) for panels: HPVA HP-1, AWS Section 4.2a, grade as specified:
 - a. Species cut and finish as scheduled on the Interior Design Drawings.
3. Manufacture plywood panels with an exterior-type adhesive complying with ASTM D 2559 and containing no urea formaldehyde.

D. Moisture Resistant Medium-Density Fiberboard (for Flush Cabinet Doors): ANSI A208.2, Grade MD made with binder containing no urea formaldehyde.

E. Thermoset Decorative Panels: Particleboard or medium-density fiberboard finished with thermally fused, melamine-impregnated decorative paper complying with LMA SAT-1.

1. Provide PVC or polyester edge banding complying with LMA EDG-1 on components with exposed or semi-exposed edges.

F. Hardboard: AHA A135.4.

G. Laminate for exposed surfaces of Plastic Laminated cabinets and countertops (Casework): All plastic laminates shall meet the requirements of NEMA LD 3 and ANSI A161.2 for high-pressure decorative laminates. Plastic laminate types and nominal minimum thicknesses for casework components shall comply with the following requirements:

February 27, 2026

1. Horizontal Surfaces other than Countertops: HGS Grade, 0.050-inch nominal thickness.
 2. Postformed for Horizontal Surfaces: HGP Grade, 0.042-inch nominal thickness.
 3. Vertical Surfaces: HGS Grade, 0.050-inch nominal thickness.
 4. Edges: PVC edge banding, 0.12 inch thick, matching laminate in color, pattern, and finish.
- H. Semi-Exposed Surfaces
1. Interior surfaces of cabinets shall be CLS cabinet liner grade where indicated. Cabinet liner standard grade plastic laminate shall be 0.020 inches in thickness.
 2. Drawer Sides and Backs: Hardwood Plywood, shop finished..
 3. Drawer Bottoms: Tempered Hardboard.
- I. Concealed Backs of Panels with Exposed Plastic Laminate Surfaces: High-pressure decorative laminate, Grade BKL.
- J. Concealed Backs of Panels with Exposed Surfaces: Thermally fused, melamine-impregnated decorative paper complying with LMA SAT-1.
- K. Fasteners and Anchorages: Provide nails, screws and other anchoring devices of the proper type, size, material and finish for application indicated to provide secure attachment, concealed where possible, and complying with applicable ANSI specification. Provide all fasteners and anchorages with a hot-dipped zinc coating (ASTM A 153). Fasteners at wet areas shall be stainless steel.
- L. Adhesives:
1. Aliphatic-resin, polyurethane, or resorcinol wood glue recommended by manufacturer for general carpentry use.
 - a. Use wood glue that has a VOC content of 30 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24)
 2. Multipurpose Construction Adhesive: Formulation complying with ASTM D 3498 that is recommended for indicated use by adhesive manufacturer.
 - a. Use adhesive that has a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.04 CASEWORK; PLASTIC LAMINATE

- A. Quality standard: Comply with AWS Section 10 – “Casework”
- B. Laminate casework:
1. Grade: Custom grade.
 2. Construction: Flush overlay.
 3. Exposed surfaces: Refer to Article 2.03.G.
 4. Semi-Exposed Surfaces: Interior surfaces of doors, interior of cabinet and casework shall be CLS cabinet liner grade where indicated.

February 27, 2026

- a. Drawer Sides and Backs: Hardwood Plywood, shop finished.
- b. Drawer Bottoms: Hardboard
- C. Laminate Color, Patterns and Finishes: As scheduled on the Interior Drawings.

2.05 HARDWARE

- A. Shelf support pins: Provide 1/4-inch self pins with rubber cushion pads; nickel finish.
 - 1. Hafele Shelf Support Catalog No. 282.04.739
 - 2. Rockler Woodworking and Hardware Model # 33860.
- B. Cabinet hinges: Fully concealed adjustable hinges.
 - 1. Unless otherwise noted, all cabinet hinges shall be self-closing, full overlay and shall allow for 120 degree opening. Provide mounting plates and accessories as required.
 - a. Hafele Duomatic 200 Series; screw mount Catalog No. 329.03.503.
- C. Drawer slides
 - 1. Full extension slides; 100 lbs. load rating, Bright Electro-zinc finish.
 - a. Accuride No. 7432.
- D. Pulls: As indicated on the Drawings.
- E. Grommets for Cable Passage through Countertops: 2-inch OD, black -plastic grommets and matching plastic caps with slot for wire passage.
- F. ADA Compliance: Hardware on cabinets and drawers required to be accessible shall comply with Section 309.4 of the Department of Justice's 2010 ADA Standards for Accessible Design.

2.06 FABRICATION

- A. Cabinet Grade: Unless otherwise indicated, provide Custom-grade cabinets complying with AWS Section 10 – "Casework".
- B. Wood Moisture Content: Comply with requirements of referenced quality standard for wood moisture content in relation to ambient relative humidity during fabrication and in installation areas.
- C. Fabricate casework to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:
 - 1. Corners of Cabinets and Edges of Solid-Wood (Lumber) Members and Rails: 1/16 inch.
- D. Drawers: Sides blind dovetail dadoed and securely glued into fronts. Sides multiple dovetailed or lock jointed and nailed, or dadoed and nailed to backs. Sides and front plowed to receive bottom.
- E. Complete fabrication, including assembly finishing, and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

February 27, 2026

- F. Notify Contracting Officer seven days in advance of the dates and times
woodwork fabrication will be complete.
- G. Trial fit assemblies at fabrication shop that cannot be shipped completely
assembled. Install dowels, screws, bolted connectors, and other fastening
devices that can be removed after trial fitting. Verify that various parts fit as
intended and check measurements of assemblies against field measurements
indicated on Shop Drawings before disassembling for shipment.
 - 1. Shop-cut openings to maximum extent possible to receive hardware,
appliances, plumbing fixtures, electrical work, and similar items. Locate
openings accurately and use templates or roughing-in diagrams to produce
accurately sized and shaped openings. Sand edges of cutouts to remove
splinters and burrs.
- H. Measurements: Obtain field measurements and verify dimensions and shop
drawing details as required for accurate fit. Provide ample borders to allow for
subsequent scribing and trimming for accurate fit when construction schedule
does not allow time for field measurements.

2.01 CABINET FABRICATION

- A. Door Construction:
 - 1. Core: 3/4-inch medium density fiberboard.
 - 2. Finish:
 - a. Plastic Laminate Cabinets: High pressure plastic laminate on both faces
with PVC edge banding.
 - 1) Interior face to match cabinet interior color.
- B. Drawer Construction
 - 1. Drawer Fronts:
 - a. Plastic Laminate Cabinets: 3/4-inch- medium density fiberboard with high
pressure plastic-laminate-on both faces and PVC edge banding.
 - 2. Sides, back and sub-front: 1/2-inch medium-density fiberboard finished with
thermally fused, melamine-impregnated decorative paper complying with
LMA SAT-1 with PVC edge banding.
 - 3. Bottoms: 1/4-inch tempered hardboard.
 - 4. Construction: Sides doweled and securely glued into sub-fronts and drawer
backs. Sides and sub-front plowed to receive bottom. Draw face to be back
screwed to sub-front from interior of drawer.
- C. Cabinet End Construction:
 - 1. Exposed and Semi-exposed Ends:
 - a. Plastic Laminate Cabinets: 3/4-inch thick plywood overlaid with high
pressure plastic laminate with PVC edge banding.
 - 2. Drill end panel to receive adjustable shelf pins, two rows of 5-mm diameter
holes spaced 1-1/4-inch on center.

February 27, 2026

- D. Cabinet Backs, Tops and Bottoms: 3/4-inch thick plywood overlaid with high pressure plastic laminate with PVC edge banding.
- E. Shelves: Plywood overlaid with high pressure plastic laminate and front edge finished with PVC banding in the following thicknesses:
 - 1. Shelves spanning up to 30-inches: 3/4-inch thick
 - 2. Shelves spanning 31-inches to 42-inches: 1-inch thick.
- F. Cabinet Partitions: 3/4-inch thick plywood overlaid with high pressure plastic laminate with PVC edge banding.
- G. Cabinet Bases:
 - 1. Plastic Laminate Cabinets: Constructed from 3/4-inch thick plywood overlaid with high pressure plastic laminate.
 - 2. Heights as indicated on the Drawings.
- H. Filler and Soffit Panels:
 - 1. Plastic Laminate Cabinets: 3/4-inch- plywood with high pressure plastic-laminate-on both faces.

2.02 FACTORY FINISHING OF INTERIOR ARCHITECTURAL WOODWORK

- A. General: The entire finish of interior architectural woodwork is work of this section, regardless of whether factory-applied or applied after installation.
 - 1. Factory finishing: To the greatest extent possible, finish architectural woodwork at factory. Defer only final touch-up, cleaning and polishing for time after delivery and installation.
- B. Preparations for finishing: Comply with AWS Section 5 – “Finishing” standard for sanding, filling countersunk fasteners, sealing of concealed surfaces and similar preparations for finishing of architectural woodwork, as applicable to each unit of work.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine the surfaces and conditions under which work of this section will be performed. Do not proceed until unsatisfactory conditions detrimental to timely and proper completion of the work have been corrected.

3.02 PREPARATION

- A. Condition casework to average prevailing humidity conditions in installation areas prior to installing.

3.03 INSTALLATION

- A. Comply with AWS Section 10 – “Casework”.
 - 1. Grade: Custom.

February 27, 2026

- B. Install casework plumb, level, true and straight with no distortions. Shim as required using concealed shims. Install to a tolerance of 1/8" in 8'-0" for plumb and level, including tops with no variations in flushness of adjoining surfaces.
- C. Scribe and cut woodwork to fit adjoining work. Refinish cut surfaces or repair damaged finish at cuts.
- D. Anchor casework to anchors or blocking built-in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation.
- E. Install casework without distortion so that doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete the installation of hardware and accessory items as indicated.
- F. Fasten each individual cabinet to floor with fasteners spaced a maximum of 24-inches on center. Fasten to walls at framing or blocking. Attachment to gypsum wallboard alone is not permitted. Where required, assemble units into one integral unit with joints flush, tight, and uniform. Align similar adjoining doors and drawers to a tolerance of 1/16-inch.

3.04 SOLID SURFACE COUNTERTOP INSTALLATION

- A. For solid surface countertop installation, comply with Section 06615 – SOLID SURFACE MATERIAL COUNTERTOPS.

3.05 ADJUSTMENT, CLEANING AND PROTECTION

- A. Repair damaged and defective casework where possible to eliminate defects functionally and visually; where not possible to repair replace woodwork. Adjust joinery for uniform appearance.
- B. Clean, lubricate and adjust hardware.
- C. Clean casework on exposed and semi-exposed surfaces. Touch-up shop-applied finishes to restore damaged or soiled areas.
- D. Provide final protection and maintain conditions, in a manner acceptable to fabricator and installer, which ensures architectural woodwork being without damage or deterioration at time of substantial completion.

END OF SECTION

SECTION 06615 – SOLID SURFACE MATERIAL COUNTERTOPS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Solid surface material countertops and backsplashes.
- B. Related Sections:
 - 1. Section 06100 - ROUGH CARPENTRY.
 - 2. Section 06400 – ARCHITECTURAL CASEWORK

1.02 SUBMITTALS

- A. Submit under the provisions of Section 01330 - SUBMITTALPROCEDURES.
- B. Manufacturer's Data: Submit manufacturer's technical data for each type of countertop material, accessory and other manufactured product required.
- C. Shop Drawings: Submit cutting and setting drawings indicating sizes, dimensions, sections and profiles of solid surface units, arrangement and provisions for jointing,.
- D. Sealant supporting, anchoring and bonding solid surface material; and other details showing relationships with, attachment to, and reception of, related work such as sinks and plumbing fixtures.
- E. Samples: Submit sets of samples for each type of solid surface countertop consisting of units not less than 12 inches by 12 inches. Include 2 or more units in each set of samples showing the full range of appearance characteristics to be expected in completed Work.
- F. Maintenance Data: For solid surface countertops to include in maintenance manuals. Include Product Data for solid surface care products used or recommended by Installer, and names, addresses, and telephone numbers of local sources for products.

1.03 QUALITY ASSURANCE

- A. Fabricator Qualifications: Engage a fabricator that employs skilled workers who custom-fabricate solid surface countertops and who has successfully completed work similar in material, design and extent to that indicated for this project. The fabricator shall be the installer of the countertops.
- B. Cut all openings from templates for plumbing fixtures, trim, and accessories to be mounted.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver no components to project site until areas are ready for installation.
- B. Store components indoors prior to installation.

February 27, 2026

- C. Handle materials to prevent damage to finished surfaces.
 - 1. Provide protective coverings to prevent physical damage or staining following installation for duration of project.

1.05 PROJECT CONDITIONS

- A. Field Measurements: Verify dimensions of countertops by field measurements before countertop fabrication is complete.

1.06 COORDINATION

- A. Coordinate locations of utilities that will penetrate countertops.

1.07 WARRANTY

- A. Provide manufacturer's warranty against defects in manufacturing and workmanship of solid surface assemblies for a period of fifteen (15) years from the Project Acceptance date.

PART 2 - PRODUCTS

2.01 SOLID SURFACE MATERIAL COUNTERTOPS

- A. Countertops and Backsplashes: 1/2-inch- thick, solid surface material with beveled edges.
- B. Fabrication: Fabricate tops in one piece unless otherwise indicated. Comply with solid surface material manufacturer's written instructions for adhesives, sealers, fabrication, and finishing.

2.02 COUNTERTOP MATERIALS

- A. Solid Surface Material: Homogeneous solid sheets; cast, nonporous, filled polymer, not coated, laminated or of composite construction with through body colors meeting ANSI Z124.3 or ANSI Z124.6.
 - 1. Basis-of-Design Product: Products described in this Section are products of Wilsonart Solid Surface. Subject to compliance with requirements, provide products by one of the following:
 - a. Dupont Corian
 - b. Formica.
 - c. or Approved Equal.
 - 2. Colors and Patterns: As scheduled.
 - 3. Nominal Thickness: 1/2- inch minimum thickness as indicated.
 - 4. Edge Detail: As Detailed.
 - 5. Splashes: Provide 1/2-inch-thick backsplashes and end splashes, unless otherwise indicated.

February 27, 2026

- a. Height: As indicated on the Drawings.
- b. Top-Edge-Detail: As Detailed.
- 6. Joint Adhesive: Manufacturer's standard one- or two-part adhesive kit to create inconspicuous, nonporous joints.
 - a. Adhesive shall have a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- 7. Sealant: Manufacturer's standard mildew-resistant, FDA-compliant, NSF 51-compliant (food zone — any type), UL-listed silicone sealant in colors matching components.
 - a. Sealants shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.03 FABRICATION

- A. Fabricate solid surface material countertops in sizes and shapes required to comply with requirements indicated, including details on Drawings and final shop drawings. Provide matching backsplash.
- B. Joints: To the great extent possible, fabricate countertops to be one piece with no joints.
 - 1. Where joints are unavoidable, form joints between components using manufacturer's standard joint adhesive without conspicuous joints. Reinforce with strip of solid polymer material, 2" wide.
- C. Cutouts: Cut openings to accommodate other work and indicated features.
 - 1. Cutouts shall have 3/8 inch minimum inside corner radius. Inside corners shall be reinforced in an acceptable manner to prevent cracking. Smooth edges.
- D. Cut and drill sinkages and holes in solid surface material for anchors, supports, and attachments.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Require Installer to examine surfaces to receive solid surface countertops and conditions under which countertops will be installed and to report in writing any conditions which are not in compliance with requirements. Do not proceed with installation until surfaces and conditions comply with requirements indicated or for execution of other work which affects the installation.
- B. Verify that substrates supporting solid surface countertops are plumb, level, and flat to within 1/16 inch in ten feet and that necessary supports and blocking are in place.

3.02 INSTALLATION

- A. Execute installation of solid surface countertops by skilled mechanics. Do necessary field cutting as counters are set. For exposed edges, produce edges which are cut straight and true.
- B. Set counters to comply with requirements indicated on drawings and final shop drawings. Install supports, fasteners, and other attachments indicated or necessary to secure counters in place. Shim and adjust anchors, supports and accessories to set counters accurately in locations indicated with uniform perimeter joints of widths indicated and with edges and faces aligned according to established relationships and indicated tolerance.
- C. Anchor securely to base cabinets or other supports.
- D. Install applied backsplashes using manufacturer's standard color-matched silicone sealant. Adhere applied backsplashes to countertops using manufacturer's standard color-matched silicone sealant.
- E. Install countertops and backsplashes plumb, level, square and flat to within 1/16-inch in ten feet.
- F. Apply sealant to gaps specified for filling with sealant. Remove temporary shims before applying sealant.

3.03 ADJUSTMENTS AND CLEANING

- A. In-Progress Cleaning: Clean countertops as work progresses. Remove adhesive and sealant smears immediately.
- B. Remove and replace countertop if broken, chipped, stained or otherwise damaged that cannot be repaired to the Architect's satisfaction.
- C. Replace in manner which results in countertops matching approved samples, complying with other requirements and showing no evidence of replacement.
- D. Clean countertops after adhesives and sealants have fully cured and set, using clean water and soft rags. Do not use wire brushes, acid-type cleaning agents, cleaning compounds with caustic or harsh fillers, or other materials or methods that could damage countertops.

END OF SECTION

DIVISION 7 – THERMAL AND MOISTURE CONTROL

SECTION 07130 - ELASTOMERIC SHEET WATERPROOFING

PART 1 - GENERAL

1.01 SUMMARY

- A. The Work of this Section includes but is not limited to retaining walls, planters, and other foundation areas.
- B. Provide waterproofing system to prevent the passage of liquid water and install without defects, damage or failure. Waterproofing shall be sheet membrane waterproofing with all applicable accessory products.
 - 1. Planter walls that are backfilled.
- C. Related Documents and Section: Examine Contract Documents for requirements that directly affect or are affected by Work of this Section. A list of those Documents and Sections includes, but is not limited to the following:
 - 1. Section 03300 – CAST IN PLACE CONCRETE
 - 2. Section 07241 – DIRECT-APPLIED EXTERIOR FINISH SYSTEM
 - 3. Section 07910 – EXTERIOR WALL JOINT SEALANTS
 - 4. Section 09310 – CERAMIC TILE

1.02 SUBMITTALS

- A. Submit under the provisions of Section 01330 - SUBMITTAL PROCEDURES.
- B. Submit manufacturer's product data, installation instructions and membrane samples for approval.
- C. Certification in the form of a letter, on the manufacturer's letterhead and signed by a technical representative of the manufacturer, that the Waterproofing System to be furnished complies with these specifications.
- D. Complete instructions for handling, storage, mixing, priming, installation and protection of the Waterproofing System.
- E. Shop drawings: Manufacturer to acknowledge review of shop drawings.
 - 1. Drawings showing overall waterproofing areas and flashing details.
 - 2. Shop drawings shall incorporate actual project specific conditions such as framing, shoring, forming and substrates and show adjacent materials and terminations/coordination with those materials.
 - 3. Where this material and adjacent waterproofing materials are flashed to each others, provide coordinated shop drawings clearly noting "tie-in" details and including all adjacent materials and substrates. Included shall be lagging-to-double sided form transitions and transitions to vapor barrier.
- F. Certification showing that all waterproofing components are being supplied and warranted by a single-source manufacturer.

1.03 REFERENCE STANDARDS

- A. The following standards and publications are applicable to the extent referenced in the text.
- B. American Society for Testing and Materials (ASTM):
 - 1. ASTM C 826 - Standard Specification for High Solids, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course
 - 2. ASTM D 412 - Standard Test Methods for Rubber Properties in Tension
 - 3. ASTM D 570 - Standard Test Method for Water Absorption of Plastics
 - 4. ASTM D 903 - Standard Test Method for Peel or Stripping Strength of Adhesive Bonds
 - 5. ASTM D 1434 - Standard Test Method for Determining Gas Permeability Characteristics of Plastic Film and Sheeting
 - 6. ASTM D1876 - Standard Test Method for Peel Release of Adhesives (T-Peel)
 - 7. ASTM D1970 - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection
 - 8. ASTM D 3767 - Standard Practice for Rubber – Measurements of Dimensions
 - 9. ASTM D 5385 - Standard Test Method for Hydrostatic Pressure Resistance of Waterproofing Membranes
 - 10. ASTM E 96 - Standard Test Methods for Water Vapor Transmissions of Materials
 - 11. ASTM E 154 - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover
- C. NRCA Waterproofing Manual, Latest Edition

1.04 QUALITY ASSURANCE

- A. Single Source Responsibility: Sheet waterproofing is part of the complete waterproofing system of planter wall areas. All vertical waterproofing systems shall be furnished and installed by a single entity solely responsible for the waterproofing systems and all materials shall be obtained from a single source.
- B. Sheet Waterproofing shall establish and maintain a continuous waterproof seal on a permanent basis, with recognized limitations of wear and aging as indicated for each application. Failures of installed materials to comply with this requirement will be recognized as failures of materials and workmanship.
- C. Engage a single firm to assume undivided responsibility for installing all components of the Sheet Membrane Waterproofing System including all related sheet metal flashings and all other components. This firm must demonstrate not less than 5 years successful experience in installation of this system and of work similar to the work of this project. Credentials and data must be submitted

February 27, 2026

to Architect for review and approval including contact names and numbers regarding similar products.

1. Employ only skilled tradesmen who are thoroughly experienced with the materials and equipment to be used in the work. The Installer shall maintain a full-time supervisor/foreman (the same person for the duration of the project) who is at the job site during times that waterproofing work is in progress and who is experienced in installing waterproofing systems similar to type and scope required for this Project.
- D. Manufacturer Qualifications: Waterproofing membranes and all accessory products shall be provided by a single manufacturer with a minimum of 20 years' experience in the direct production and sales of waterproofing systems. The Manufacturer shall be capable of providing field service representation during construction, approving an acceptable installer, and recommending appropriate installation methods.
- E. Pre-Installation Conference: A pre-installation conference shall be held prior to commencement of field installation to establish procedures to maintain required working conditions and to coordinate this work with related and adjacent work. Verify that final waterproofing and waterstop details comply with waterproofing manufacturer's current installation requirements and recommendations.
 1. Pre-Installation meeting attendees should include representatives from the Owner, Architect, General Contractor, Waterproofing Contractor, Concrete Masonry Contractor, Excavating/Backfill Contractor, Mechanical and Electrical Contractors (if work penetrates the waterproofing) and all other trades whose work will interface with the waterproofing system.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in labeled packages. Store and handle in strict compliance with manufacturer's instructions. Protect from damage from weather, excessive temperature and construction operations. Remove and dispose of damaged material in accordance with applicable regulations.

1.06 PROJECT CONDITIONS

- A. Perform work only when existing and forecasted weather conditions are within the limits established by the manufacturer of the materials used. Proceed with installation only when the substrate construction and preparation work is complete and in condition to receive sheet membrane waterproofing.

1.07 WARRANTY

- A. Waterproofing: Provide written ten (10) year material warranty issued by the membrane manufacturer upon completion of work from date of Project Acceptance.
- B. The Surety and the Contractor shall not be held liable beyond two years from the Project Acceptance date.

PART 2 - PRODUCTS

HAWAII HEALTH SYSTEMS CORPORATION – KAUAI DIVISION

SMMH Emergency Department Renovation & Addition
Project No. 225057-01

Elastomeric Sheet Waterproofing
07130-3

2.01 MATERIALS

- A. Self-Adhered Sheet Waterproofing: Self-adhered, cold-applied composite sheet consisting of a thickness of 1.4 mm (0.056 in.) of rubberized asphalt and 0.1 mm (0.004 in.) of cross-laminated, high density polyethylene film. Membrane shall be covered with a release sheet which is removed during installation.
1. Basis-of-Design Product: Subject to compliance with requirements, provide GCP Applied Technologies, Inc., Bituthene 3000 or a comparable product by one of the following:
 - a. Carlisle Coatings & Waterproofing, Inc.; CCW MiraDRI 860/861
 - b. Polyguard Products, Inc.; Polyguard 650 Membrane
 - c. W.R. Meadows, Inc.; SealTight Mel-Rol
 - d. Or approved equal.
 2. Physical Properties:
 - a. Tensile Strength, Membrane: 250 psi minimum; ASTM D 412, Die C, modified.
 - b. Ultimate Elongation: 300 percent minimum; ASTM D 412, Die C, modified.
 - c. Low-Temperature Flexibility: Pass at minus 20 deg F; ASTM D 1970.
 - d. Crack Cycling: Unaffected after 100 cycles of 1/8-inch movement; ASTM C 836.
 - e. Puncture Resistance: 40 lbf minimum; ASTM E 154.
 - f. Water Absorption: 0.2 percent weight-gain maximum after 48-hour immersion at 70 deg F; ASTM D 570.
 - g. Water Vapor Permeance: 0.05 perms (2.9 ng/Pa x s x sq. m) maximum; ASTM E 96/E 96M, Water Method.
- B. Miscellaneous Materials: Detail tape and other accessories specified or acceptable to manufacturer of self-adhered and pre-applied waterproofing membranes.
1. Termination Bars: Type 316 stainless steel, 1/8-inch-thick minimum, predrilled or punched 8 inches o.c. for mechanical fastener attachment to substrate as required.
 2. Primer: Liquid waterborne or solvent-borne primer recommended for substrate by sheet-waterproofing material manufacturer.
 3. Liquid Membrane: Sheet waterproofing manufacturer's elastomeric, two-component liquid, cold fluid applied, of trowel grade or low viscosity.

2.02 MOLDED SHEET DRAINAGE PANELS

- A. Nonwoven-Geotextile-Faced, Molded-Sheet Drainage Panel: Composite subsurface drainage panel consisting of a studded, nonbiodegradable, molded-plastic-sheet drainage core; with a nonwoven, needle-punched geotextile facing

February 27, 2026

with an apparent opening size not exceeding No. 70 sieve laminated to one side of the core and a polymeric film bonded to the other side; and with a vertical flow rate of 9 to 21 gpm per ft.

1. Basis-of-Design Product: Subject to compliance with requirements, provide GCP Applied Technologies, Inc.; Hydroduct 220 or a comparable product by one of the following:
 - a. Carlisle Coatings & Waterproofing, Inc.; CCW MiraDRAIN 6200
 - b. Polyguard Products, Inc.; Polyflow 15P
 - c. W.R. Meadows, Inc.; Mel-Drain
- B. Perimeter Drain consisting of Non-Woven-Geotextile Faced with High-Strength Backing Film, with dual profile drainage core, with a flow rate of 21 gal/min/sf per ASTM D4716.
 1. Basis-of-Design Product: Subject to compliance with requirements, provide GCP Applied Technologies, Inc.; Hydroduct Coil 600.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. The installer shall examine conditions of substrates and other conditions under which this work is to be performed and notify the Contractor, in writing, of circumstances detrimental to the proper completion of the work. Do not proceed with work until unsatisfactory conditions are corrected.
- B. Verify the concrete masonry wall has been parged smooth with patching and leveling materials as specified in Section 07241 – DIRECT-APPLIED EXTERIOR FINISH SYSTEM.

3.02 SHEET WATERPROOFING INSTALLATION, VERTICAL APPLICATION

- A. Preparation:
 1. All surfaces shall be structurally sound and free of voids, spalled areas, loose aggregate and sharp protrusions. Remove contaminants such as grease, oil and wax from exposed surfaces. Remove dust, dirt, loose stone and debris. Use repair materials and methods which are acceptable to manufacturer of sheet membrane waterproofing.
 2. Concrete Masonry Unit Substrates:
 - a. Do not proceed with installation until parging has properly cured and dried a minimum 7 days.
- B. Installation:
 1. Refer to manufacturer's literature for recommendations on installation, including but not limited to, the following:
 - a. Apply surface conditioner at rate recommended by manufacturer. Recoat areas not waterproofed if contaminated by dust. Mask and protect adjoining exposed finish surfaces to protect those surfaces from excessive application of surface conditioner.

February 27, 2026

- b. Delay application of membrane until surface conditioner is completely dry. Dry time will vary with weather conditions.
- c. Install a 3/4-inch fillet of liquid membrane in corner extending 2-1/2-inches onto wall and footing. Allow to cure.
- d. Apply a 12-inch self-adhering sheet strip centered over the outside corner of the footing.
- e. Apply self-adhering membrane down wall, onto horizontal surface of the footing, and around the outside corner of the footing.
- f. Extend sheet membrane a minimum of 6-inches down vertical surface of footing lapping onto the underslab waterproofing in accordance with approved shop drawings and waterproofing manufacturer's written instructions.
- g. Apply a bead of liquid membrane or mastic on all terminations.
- h. Seal daily terminations with troweled bead of mastic.

3.03 INSTALLATION, DRAINAGE BOARDS

A. Vertical Drainage Board:

- 1. Position so that the geotextile fabric filter is facing toward the groundwater or backfill.
- 2. Fix drainage board over waterproofing membrane with tape or adhesive recommended by sheet waterproofing manufacturer in accordance with manufacturer's instructions
- 3. Extend drainage board from top of footing up to a point 6-inches below the anticipated grade line. The exposed core along the top terminations should be covered with a strip of geotextile to prevent intrusion of soil into core.
- 4. At the bottom termination extend the drainage board out from the structure so that it passes behind and under the perimeter discharge pipe. Additional geotextile should be wrapped over the pipe to prevent soil intrusion.
- 5. Backfill immediately after installation. Do not leave drainage boards exposed to sunlight for more than two weeks. Drainage boards left exposed for more than two weeks will need to be removed and replaced with new drainage boards at no additional cost to the University.

B. Perimeter Drain:

- 1. Install per manufacturer written instructions for warrantable installation.

3.05 PROTECTION

- A. Protect waterproofing from damage and wear during remainder of construction period.
- B. Correct deficiencies in or remove waterproofing that does not comply with requirements; repair substrates, reapply waterproofing, and repair sheet flashings.

February 27, 2026

- C. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION

SECTION 07180 - TRAFFIC COATINGS

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes pedestrian surface waterproofing at Entry Lanai, Ramps, Ambulance Entry Landing, and similar areas where traffic coating is the exposed, pedestrian surface waterproofing, exterior areas where indicated.
- B. Related Sections include the following:
 - 1. Section 03300 - CAST-IN-PLACE CONCRETE
 - 2. Section 07600 – FLASHING AND SHEET METAL
- C. As manufacturer's system installation requirements and tested assemblies vary, this specification is to provide for the intent of this system. The noted performance and warranty requirements shall be met by the installed system. The contractor shall provide the manufacturer of their choice with all applicable project documents for review before the contractor shall develop and submit a bid. Whether specifically noted by the project documents or not, the contractor shall include all manufacturer requirements and recommendations (and including all project document related requirements when more stringent) in their bid.
- D. Where this system integrates with adjacent systems, provide for tie-in of this system to those systems to allow for both continuity of envelope systems and divorcing of this system from materials that are not compatible for tie-in with this system. Membrane, metal and other flashings / materials shall be utilized as required to achieve this integration.

1.02 SUBMITTALS

- A. Product Data: For each product indicated
- B. Shop Drawings: Show extent of each traffic coating. Include details for treating substrate joints and cracks, flashings, deck penetrations, and other termination conditions.
- C. Samples of Verification: For each type of traffic coating required, prepared on rigid backing and of same thickness and material indicated for the Work.
 - 1. Provide stepped Samples of backing large enough to illustrate buildup of traffic coatings.
- D. VOC Content: Manufacturers' statement of VOC content and chemical components for traffic coatings.
 - 1. Certification: Certification by the Manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs).
- E. Qualification Data: For Installer
- F. Material Test Reports: For each traffic coating.
- G. Material Certificates: For each traffic coating, signed by Manufacturers.

- H. Maintenance Data: For traffic coatings to include in maintenance manuals. Identify substrates and types of traffic coatings applied. Include recommendations for periodic inspections, cleaning, care, maintenance, and repair of traffic coatings.
- I. Warranty: Special warranty specified in this Section. Provide verification of moisture content of substrates in concert with Manufacturer warranty request requirements.
- J. Provide copies of field quality control reports.

1.03 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of traffic coatings required for this Project. This firm must demonstrate not less than 10 years successful experience in installation of work similar to the work of this project. Credential and substantiating data must be submitted to Architect.
- B. Source Limitations: Obtain traffic coatings from a single Manufacturer.
 - 2. Obtain primary traffic coating materials, including primers, from traffic coating Manufacturer. Obtain secondary materials including aggregates, sheet flashings, joint sealants, and substrate repair materials of type and from source recommended in writing by primary material Manufacturer.
- C. Fire-Test Response Characteristics: Provide traffic coating materials with the fire-test-response characteristics as determined by testing identical products per test method below for deck type and slopes indicated by an independent testing and inspecting agency that is acceptable to authorities having jurisdiction.
 - 1. Class A roof coverings per ASTM E108.
- D. Regulatory Requirements: Provide products that comply with local regulations controlling use of volatile organic compounds (VOCs).
- E. Mockups: Apply mockups to set quality standards for materials and execution.
 - 1. Architect will select one representative surface for each traffic coating and each substrate to receive traffic coatings. Apply each coating to at least 200 sq. ft. (18.58 sq. meters) of each substrate to demonstrate surface preparation, joint and crack treatment, thickness, texture, color, and standard of workmanship.
 - 2. Remove and reapply mockups until they are approved by Architect.
 - 3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- F. Pre-Installation Conference:
 - 1. Before installing traffic coatings, meet with representatives of authorities having jurisdiction, Manufacturer's technical representative, Owner, Architect, consultants, independent testing agency, and other concerned entities. Review requirements for traffic coatings. Notify participants at least seven days before conference.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages and containers with seals unbroken and bearing manufacturer's labels showing the following information:
 - 1. Manufacturer's brand name
 - 2. Type of material
 - 3. Directions of storage
 - 4. Date of manufacture and shelf life
 - 5. Lot or batch number
 - 6. Mixing and application instructions
 - 7. Color
- B. Store materials in a clean, dry location protected from exposure to direct sunlight. In storage areas, maintain environmental conditions within range recommended in writing by Manufacturer.

1.05 PROJECT CONDITIONS

- A. Environmental Limitations: Apply traffic coatings within the range of ambient and substrate temperatures recommended in writing by Manufacturer. Do not apply traffic coatings to damp or wet substrates, when temperatures are below 40 degrees F (4.44 degrees C), when relative humidity exceeds 85 percent, or when temperatures are less than 5 degrees F (-15 degrees C) above dew point.
 - 1. Do not apply traffic coatings in snow, rain, fog, or mist, or when such weather conditions are imminent during the application and curing period. Apply only when frost-free conditions occur throughout the depth of substrate.
- B. Do not install traffic coating until items that will penetrate membrane have been installed.
- C. At slabs on grade take precautions regarding vapor transmission and moisture sensitive coating application. Perform Calcium Chloride Testing (ASTM F1869-09) before placement of coating system. Review tests with manufacturer and install, if required, a moisture vapor treatment system.

1.07 WARRANTY

- A. Warranty: Manufacturer's standard labor and material warranty in which traffic coating Manufacturer agrees to repair or replace traffic coatings that deteriorate during the specified warranty period. Warranty does not include deterioration or failure of traffic coating due to unusual weather phenomena, failure of prepared and treated substrate, formation of new substrate cracks exceeding 1/16 inch (25.4 mm) in width, fire, vandalism, or abuse by snowplow, maintenance equipment, and truck traffic.
 - 1. Deterioration of traffic coatings includes the following:
 - a. Adhesive or cohesive failures.
 - b. Abrasion or tearing failures.
 - c. Surface crazing or spalling.

February 27, 2026

- d. Intrusion of water, oils, gasoline, grease, salt, deicer chemicals, or acids into deck substrate.
2. Warranty Period: Five (5) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 TRAFFIC COATING

- A. General:
 1. Traffic Coatings: Complying with ASTM C957.
 2. Materials Compatibility: Provide primers; base, intermediate, and topcoats; and miscellaneous materials that are compatible with one another and with substrate under conditions of service and application, as demonstrated by Manufacturer based on testing and field experience.
- B. Pedestrian Traffic Coating Products: Subject to compliance with requirements, provide one of the following:
 1. Neogard, Division of Jones-Blair; Peda-Gard FC (Basis of Design).
 2. Pacific Polymers; Elastodeck 5000 HT
 3. Gaco Western; Gaco Pedestrian Deck GW-14-U
- C. Primer: Manufacturer's standard factory-formulated primer recommended for substrate and conditions indicated.
 1. Material: Epoxy
- D. Base Coats: Multi-component, fast cure liquid urethane. FC7500/FC7960 (Basis-of-Design)
- E. Wear Coat: FC7510/FC7961 + 7992 aggregate (47PJB) urethane coating (Basis-of-Design).
- F. Topcoat: Single-component, liquid aliphatic urethane, FC400/FC600 (Basis-of-Design).
 1. Color: As scheduled on the Drawings.
 2. Chemical Resistant Topcoat: At areas where the coating could be exposed to chemical spills, install chemical resistant topcoat. Review list of potential chemicals at such area with coating Manufacturer and provide the most resistant / appropriate chemical resistant topcoat.
- G. Component Coat Thicknesses: As recommended by Manufacturer for substrate and service conditions indicated unless otherwise modified herein.
- H. Aggregate: Uniformly graded, washed silica sand of particle sizes, shape, and minimum hardness recommended in writing by traffic coating Manufacturer.
 1. Spreading Rate: As recommended by Manufacturer for substrate and service conditions indicated.

2.02 MISCELLANEOUS MATERIALS

- A. Joint Sealants: Coating Manufacturer recommended sealants where part of this system. At juncture with cladding systems, properly coordinate with specified

February 27, 2026

silicone sealants and provide for installation of coating to present suitable substrates for silicone sealants, including proper adhesion.

- B. Sheet Flashing: Non-staining.
 - 1. Minimum Thickness: 60 mils
 - 2. Material: Uncured neoprene sheet.
- C. Adhesive: Contact adhesive recommended in writing by traffic coating Manufacturer.
- D. Reinforcing Strip: Fiberglass mesh recommended in writing by traffic coating Manufacturer.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements and for other conditions affecting performance of traffic coatings.
 - 1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance.
 - 2. Verify compatibility with and suitability of substrates.
 - 3. Begin application only after minimum concrete curing and drying period recommended by traffic coating Manufacturer has passed, after unsatisfactory conditions have been corrected, and after surfaces are dry.
 - 4. Verify that substrates are visibly dry and free of moisture.
 - a. Test for moisture vapor transmission by plastic sheet method according to ASTM D 4263 or other manufacturer approved or recommended method.
 - b. Test for moisture content by method recommended in writing by Manufacturer.
 - 5. Verify that substrates have a minimum slope of 1/4-inch per foot (2%) to drain.
 - 6. Application of coating indicates acceptance of surfaces and conditions.
 - 7. Perform Calcium Chloride testing at slab on grade areas as noted per 1.06 / C. Install moisture vapor control system if required per test results and manufacturer's recommendations.

3.02 PREPARATION

- A. Clean and prepare substrates according to ASTM C 1127 and Manufacturer's written recommendations to produce clean, dust-free, dry substrate for traffic coating application.
- B. Mask adjoining surfaces not deck drains, and other deck substrate penetrations to prevent spillage, leaking, and migration of coatings.
- C. Concrete Substrates: Mechanically abrade concrete surfaces to a uniform profile according to ASTM D 4259. Do not acid etch.

February 27, 2026

1. Remove grease, oil, paints, and other penetrating contaminants from concrete.
2. Remove concrete fins, ridges, and other projections.
3. Remove laitance, glaze, efflorescence, curing compounds, concrete hardeners, form-release agents, and other incompatible materials that might affect coating adhesion.
4. Remove remaining loose material to provide a sound surface, and clean surfaces according to ASTM D 4258.

3.03 TERMINATIONS AND PENETRATIONS

- A. Prepare vertical and horizontal surfaces at terminations and penetrations through traffic coatings and at expansion joints, drains, and sleeves according to ASTM C 1127 and Manufacturer's written recommendations.
- B. Provide sealant cants at penetrations and at reinforced and non-reinforced, deck-to-wall butt joints.
- C. Install sheet flashings at deck-to-wall expansion and dynamic joints, and bond to deck and wall substrates according to Manufacturer's written recommendations.

3.04 JOINT AND CRACK TREATMENT

- A. Prepare treat, rout, and fill joints and cracks in substrates according to ASTM C 1127 and Manufacturer's written recommendations. Before coating surfaces, remove dust and dirt from joints and cracks according to ASTM D 4258.
 1. Comply with recommendations in ASTM C1193 for joint sealant installation.

3.05 TRAFFIC COATING APPLICATION

- A. Apply traffic coating material according to ASTM C1127 and Manufacturer's written recommendations.
 1. Start traffic coating application in presence of Manufacturer's technical representative.
 2. Verify that wet film thickness of each component coat complies with requirements every 100 sq. ft (9.29 sq. meters).
- B. Apply traffic coatings to prepared wall terminations and vertical surfaces to height indicated and omit aggregate on vertical surfaces.
- C. Cure traffic coatings according to Manufacturer's written recommendations. Prevent contamination and damage during application and curing stages
- D. Integrate installation of coating with adjacent building envelope and other construction systems. Provide membrane or metal flashings or other similar materials to either tie-in this system to adjacent systems and / or divorce this system from other systems.

3.06 FIELD QUALITY CONTROL

February 27, 2026

- A. Testing: Engage a qualified testing agency to perform the following field tests and inspections and prepare test reports:
 - 1. Samples of material delivered to Project site shall be taken, identified, sealed, and certified in presence of Contractor.
 - 2. Testing agency shall perform tests for characteristics specified, using applicable referenced testing procedures.
 - 3. Testing agency shall verify thickness of coatings during traffic coating application.
 - 4. If test results show traffic coating materials do not comply with requirements, remove non-complying materials, prepare surfaces, and reapply traffic coatings.
 - 5. For each substrate to which traffic coating is applied the Manufacturer or Installer shall conduct field adhesion tests in accordance with ASTM D 4541 with calibrated testing device such as Defelsko or equivalent.
- B. Final Traffic Coating Inspection: Arrange for traffic coating Manufacturer's technical personnel to inspect membrane installation on completion.
 - 1. Notify Architect or Owner 48 hours in advance of date and time of inspection.
- C. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- D. Water Testing:
 - 1. Areas shall be water tested per guidelines established by ASTM D 5957. If failures occur, testing shall take place until such time that all areas pass water test. Testing shall be documented in writing and presented for acceptance of successful water testing.

3.07 PROTECTING AND CLEANING

- A. Protect traffic coatings from damage and wear during remainder of construction period.
- B. Clean spillage from adjacent construction using cleaning agents and procedures recommend by Manufacturer of affected construction.

END OF SECTION

SECTION 07210 - BUILDING INSULATION

PART 1 - GENERAL

1.01 SUMMARY

- A. Work Includes: The extent of building insulation work is shown on the drawings, by the generic name.
- B. The types of building insulation specified in this section include, but are not limited to, the following:
 - 1. Acoustical batt insulation for interior partitions.
 - 2. Polyisocyanurate board insulation for above and below roof deck applications.
- C. Related Sections include the following:
 - 1. Section 07410 -STANDING SEAM METAL ROOFING
 - 2. Section 07540 – TPO MEMBRANE ROOFING

1.02 QUALITY ASSURANCE

- A. Fire and Insurance Ratings: Provide insulation materials which are identical to those whose fire performance characteristics, as listed for each material or assembly of which insulation is a part, have been determined by testing, per methods indicated below, by UL or other testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Surface Burning Characteristics: ASTM E 84.
 - 2. Fire Resistance Ratings: ASTM E 119.
 - 3. Combustion Characteristics: ASTM E 136.

1.03 SUBMITTALS

- A. Submit under the provisions of Section 01330 – SUBMITTAL PROCEDURES.
- B. Manufacturer's Data: Submit manufacturer's specifications and installation instructions for types of insulation required. Include data substantiating that materials comply with specified requirements.
- C. Material Safety Data Sheets (MSDS): Submit MSDS for each material.

1.04 SAFETY PRECAUTIONS

- A. Respirators and Other Concerns: Comply with OSHA 29 CFR 1910.134, "Respiratory Protection, ASTM C 930, "Potential Health and Safety Concerns Associated with Thermal Insulation Materials and Accessories", and other Federal, State and local regulations governing safety. Provide workers with dust/mist respirators, training in their use, and protective clothing as approved by the National Institute for Occupational Safety and Health (NIOSH)/Mine Safety and Health Administration (MSHA).
- B. Smoking: Do not smoke during installation of blanket insulation.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials to site in original sealed wrapping bearing manufacturer's name and brand designation, specification number, type, grade, R-value, and class. Store and handle to protect from damage. Do not allow insulation materials to become wet, soiled or crushed. Comply with manufacturer's recommendations for handling, storing, and protecting of materials before and during installation.
- B. Storage: Inspect materials delivered to the site for damage; unload and store out of weather in manufacturer's original packaging. Store only in dry locations, not subject to open flames or sparks, and easily accessible for inspection and handling.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

- A. Available Manufacturers: Subject to compliance with requirements provide products by one of the following manufacturers:
 - 1. Certainteed Corporation.
 - 2. Johns Manville.
 - 3. Knauf Insulation
 - 4. Owens Corning.

2.02 MATERIALS

- A. Asbestos Prohibition: No asbestos containing materials or equipment shall be used in this section. The Contractor shall ensure that all materials and equipment incorporated in the project are asbestos-free.
- B. Acoustical Wall Insulation: ASTM C 665, Type I, unfaced, except a flame spread of 25 or less and a smoke developed rating of 50 or less when tested in accordance with the procedures of ASTM E 84 fiberglass or mineral wool insulation batt for noise control in partitions where shown; unfaced friction fit, sized to fit framing spacing. Provide in a minimum thickness of 2-1/2-inches for any single layer but not less than required to comply with Sound Transmission Class called for in the Drawings. STC values as determined in accordance with ASTM C 423.
 - 1. Minimum Thicknesses:
 - a. Wall Assemblies: 3-1/2-inches minimum
- C. Polyisocyanurate Board Insulation: ASTM C 1289-13, Type II, Class 1, Grade 3, 25 psi compressive strength, glass-fiber mat facer on both major surfaces, meeting membrane manufacturer's requirements.
 - 1. Above Roof Deck Minimum R-Value: R-20
 - 2. Underside of Roof Deck Minimum R-Value: R38
- D. Recycled Materials: Provide insulation containing recycled materials to the extent practicable, provided the materials meet all other requirements of this section. The minimum required recycled materials content by weight are:
- E. Rock Wool: 75 percent slag

February 27, 2026

- F. Fiberglass: Minimum 25 percent glass cullet

2.03 ACCESSORIES

- A. Mechanical Fasteners: Corrosion resistant fasteners as recommended by the insulation manufacturer.
- B. Wire Mesh Assemblies: Copper, brass, bronze, or AISI Type 304 stainless steel wire cloth, 8 x 8 x 0.025 minimum to 2 x 2 x 0.063 maximum mesh size.
- C. Insulation Fasteners: Adhesively Attached, Spindle-Type Anchors, plate welded to projecting spindle; capable of holding insulation of thickness indicated securely in position indicated with self-locking washer in place; and complying with the following requirements:
1. Product: AGM Industries, Inc.; Series T TACTOO Insul-Hangers.
 2. Plate: Perforated galvanized carbon-steel sheet, 12-gauge by 2-inches square.
 3. Spindle: Copper-coated, low carbon steel; fully annealed; 0.105-inch in diameter; length to suit depth of insulation indicated.
- D. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch thick galvanized steel sheet, with beveled edge for increased stiffness, sized as required to hold insulation securely in place, but not less than 1-1/2 inches square or in diameter.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. General:
1. Comply with manufacturer's instructions for the particular conditions of installation in each case. If printed instructions are not available or do not apply to the project conditions, consult the manufacturer's technical representative for specified recommendations before proceeding with the work.
 2. Extend wall insulation full thickness as shown over entire area to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections which interfere with placement.
 3. Apply a single layer of insulation of the required thickness, unless otherwise shown or required to make up the total thickness.
 4. Insulation shall be installed after construction has advanced to a point that the installed insulation will not be damaged by remaining work.
 5. Space insulation from heat producing devices as recommended by the manufacturer, but not closer than 3 inches.
 6. Electrical Wiring: Do not install insulation in a manner that would sandwich electrical wiring between two layers of insulation.
- B. Cavity Installations: For thermal and acoustical units, comply with the following:
1. To a Depth of 6-inches: Friction fit units; full depth.

2. Greater than 6-inches in Depth: When required to be fully filled with insulation, build up with additional layers. Where not required to be filled to full depth and not scheduled to be supported in place with other materials, comply with requirements for “Hung Installations”.
- C. Hung Installations
1. Wire Cloth: For thermal and acoustical units, hang units in place with wire mesh. Wire mesh to be taut and without sag. Fasten with wide head fasteners or fasteners with washers larger than mesh size.
 2. Spindle Type Anchors: For thermal and acoustical units in cavities that exceed insulation thickness and are not loose laid installations, comply with the following.
 - a. General: Adhere pin flanges to solid surfaces. Space pins in a manner to fully support insulation. Impale insulation over pins and apply pin clips snug against insulation. If pin extension interferes with subsequent installed work and where pins are installed in people accessible spaces, e.g., attics, clip pins as short as possible and blunt pointed edges. Blunt edges not to interfere with future removal of pin clips.
 - b. Vertical Wall Cavities: Where insulation is not full depth, e.g., 4-inch insulation is required in 12-inch depth cavity, impale with pins at 16-inches on center across top end of insulation.
 - c. Horizontal Cavities: Impale pins at 12-inches on center maximum at perimeters and in field of each unit to prevent sagging. Adhere pins to solid surfaces.
- D. Loose Laid Installations: Lay function monolithically over required horizontal substrates. Do not leave gaps between adjacent butting units.

3.02 PROTECTION

- A. Protect installed insulation and facing from harmful weather exposures and from possible physical abuses, where possible by non-delayed installation of concealing work or, where that is not possible, by temporary covering or enclosure.

END OF SECTION

SECTION 07241 – DIRECT-APPLIED EXTERIOR FINISH SYSTEM (DEFS)

PART 1 -GENERAL

1.01 SUMMARY

- A. Section Includes: Direct-Applied Exterior Finish System over a concrete substrate and accessories indicated, specified, or required to complete installation.
 - 1. Sealants and caulking as specified in Section 07910 - EXTERIOR WALL JOINT SEALANTS.
 - 2. All flashings and counter flashings, flashings around penetrations, end dams, and trim as shown, or as may be required in conjunction with system or to join systems to adjacent construction.
 - 3. Water resistive air barriers.
- B. Related work not included in this section:
 - 1. Section 03300 – CAST-IN-PLACE CONCRETE
 - 2. Section 07910 - EXTERIOR WALL JOINT SEALANTS

1.02 CODES AND STANDARDS

- A. In addition to referenced codes and standards within this specification, the work shall comply with the latest edition of the following standards. When conflicts arise between standards, the more stringent shall apply.
 - 1. ASTM – American Society for Testing and Materials
 - a. ASTM C150, Specification for Portland Cement.
 - b. ASTM E 2134 Test Method for Evaluating the Tensile-Adhesion Performance of Exterior Insulation and Finish Systems (EIFS)
 - c. ASTM E2568-09e1 PB Exterior Insulation and Finish Systems (EIFS)
 - 2. ANSI – American National Standards Institute– Latest Edition
 - a. ANSI/EIMA 99-A, American National Standards for EIFS
 - 3. EIFS Industry Manufacturers Association, latest specifications and requirements.
 - 4. EIMA (EIFS Industry Members Association) Standards and Publications
 - a. 101.02 Standard Test Method for Resistance to Water Penetration of Exterior Insulation and Finish Systems (EIFS), Class PB (Modified ASTM E-331)
 - b. 101.03 Standard Test Method for Determining Tensile Adhesion Strength of Exterior Insulation and Finish System (EIFS), and Components, Class PB (Modified ASTM C-297)
 - c. 105.01 Standard Test Method for Alkali Resistance of Glass Fiber Reinforcing Mesh for Use in Exterior Insulation and Finishing Systems (EIFS), Class PB
 - 5. IBC 2018 with Kauai County Amendments

1.03 DRAWINGS AND SPECIFICATIONS

- A. Contract Drawings are diagrammatic. The details shown are intended as a guide for the aesthetic and interfacing requirements of the various components of the exterior wall to and with other work; details are intended to establish basic dimensions of the module and the sight lines, jointing and profiles of members. The Exterior Wall Contractor is responsible for the design and engineering of the system within these aesthetic parameters. The drawings are not to be construed as engineering design, or adequate to meet the engineering design requirements.
- B. Design conditions not included in Contract Drawings shall be developed through the Exterior Wall Contractor's shop drawings in compliance with these specifications. Architect shall have the final say as to all matters whether detailed or not on the architectural design details.

1.04 SYSTEM DESCRIPTION

- A. DEFS: Class PB type of lamina adhesively attached to a moisture barrier coated cementitious or sheathed (soffit) substrate with an integrally reinforced base coat and a texture protective finish coat.

1.05 ACTION SUBMITTALS

- A. Product Data: Manufacturer's technical literature for each product indicated, specified, or required; include the following:
 - 1. Manufacturer's product data
 - 2. Manufacturer's written installation instructions/recommendations, including construction details and fabrication methods.
 - 3. Instructions/recommendations for storage, protection and handling.
- B. Samples for Verification:
 - 1. 18 in square of each DEFS finish, color and texture specified. Layer sample so that each coat can be seen; on rigid backing.
 - 2. 12 in long of each trim accessory, as requested by architect.
 - 3. 12 in long of each foam trim profile.
 - 4. Each fastener.
- C. Shop Drawings: Prepared by Exterior Wall Contractor, with detailed plans, elevations, sections, and large-scale details of products; include the following:
 - 1. Descriptions, types, sizes, and profiles of products; including those concealed.
 - 2. Products, sizes, spacings, and edge distances of attachment devices.
 - 3. Manufacturers, products, types, thicknesses, and layers of finishes.
 - 4. Material, thicknesses, profiles, and other details for flashings, gutters, and drainage troughs.
 - 5. Provisions for expansion and contraction, including dimension limits of movement for moving joints.

February 27, 2026

6. Maximum and minimum joint sizes, including sealants and backer rods.
 7. Isometric details as requested by Architect.
- D. Shop Drawings Resubmittals:
1. Identify revisions with date, number and revision clouds.
 2. Respond to Architect's comments in writing.
 3. Contractor is fully responsible for any resultant delay caused by failure to comply.

1.06 INFORMATIONAL SUBMITTALS

- A. Installer Qualifications: Data for company, principal personnel, experience, and training specified in PART 1 "Quality Assurance" Article.
- B. Warranty: Copy of specified warranty.
- C. Manufacturers Project Acceptance Certification: Statement from manufacturer certifying products are suitable for use in specific locations, for specific details, and for applications indicated, specified, or required; and that warranty will be issued.
- D. Test Reports: Reports, by qualified testing agency, showing compliance with performance requirements where test methods are indicated.

1.07 CLOSE-OUT SUBMITTALS

- A. Record Shop Drawings: Record actual installation that varies from that shown originally, giving particular attention to concealed components that would be difficult to identify later; comply with appropriate Division 01 Section.

1.08 QUALITY ASSURANCE

- A. The Exterior Wall Contractor assumes undivided responsibility for the manufacturing, fabrication, and installation of the Work as described above and herein. Including:
 1. Securing a weathertight seal with all systems, surfaces and materials.
 2. Continuity of the weather-barrier to adjacent systems for a complete air/water barrier system.
- B. DEFS Manufacturer Qualifications:
 1. Company with not less than 10 years experience in manufacturing products similar to scope of this Project with a record of successful in-service performance, and minimum manufacture of 1,000,000 square feet of class PB EIFS/DEFS.
 2. Member in good standing of the EIFS Industry Members Association (EIMA).
 3. Certified Manufacturing Facilities with ISO 9001 and ISO 14001 by ANSI-RAB
 4. Provide technical support by local technical representative employed by the manufacturer and having a minimum 10 years documented experience.

5. Manufacturer's representative shall periodically inspect material and installation to ensure installation is proceeding in accordance with manufacturer's recommendations and warranty requirements. Representative shall submit a written report of each visit indicating observations, findings and conclusions of inspection.
- C. Installer Qualifications:
1. Experience: Licensed, bonded and insured Company with not less than 10 years experience in performing specified work similar in design, products, and extent to scope of this Project; with a record of successful in-service performance; and with sufficient production capability, facilities, and trained and skilled personnel. Minimum installation experience of of 100,000 square feet of class PB EIFS/DEFS.
 2. Supervision: Maintain a competent supervisor who is at Project during times specified work is in progress, and who is experienced in installing work similar in design, products, and extent to scope of this Project.
 3. Manufacturer Qualification: Certified to manufacturer to install specified work.
- D. Field Samples for Aesthetic Purposes: Before beginning work of this Section, build as many field samples as required by Architect to verify selections made under submittals and to demonstrate aesthetic effects of EIFS (not for work execution).
1. Use same Subcontractors, including supervisors, which will perform work on Project.
 2. Finish various components to show maximum variation that will exist.
 3. Approval is for, but not limited to, following aesthetic qualities:
 - a. Color quality and uniformity of appearance.
 - b. Texture quality and uniformity of appearance.
 4. Protect and maintain approved field samples during construction in an undisturbed condition as a standard for judging completed work.
 5. When directed, demolish and remove from Project.
- E. Pre-Installation Conference: Before beginning work of this Section, conduct conference at site to comply with requirements of applicable Division 01 Sections.
1. Coordinate with Section 07240 - DRAINABLE EXTERIOR INSULATION AND FINISH SYSTEM.
 2. Reports: Record discussions, including decisions and agreements reached, and prepare report.
- F. All shop and field materials as well as workmanship are subject to inspection by the Owner and Architect at all times. Such inspections do not relieve the Exterior Wall Contractor from obligations to comply with all requirements of the Contract Documents.

1.09 DESIGN REQUIREMENTS

A. Impact Resistance

1. Provide ultra-high impact resistance, in accordance with ASTM E 2486, to a

February 27, 2026

minimum height of 6 ft. above finished grade of first level at all areas accessible to pedestrian traffic and other areas exposed to abnormal stress or impact. Areas identified in Shop Drawings.

B. Color Selection

1. Finish coat with a light reflectance value of 20 or greater. Dark colors are not recommended.

C. Joints

1. General: Design and location of expansion joints in the DEFS system is the responsibility of the Subcontractor.
2. Install joints at the following locations, but not limited to:
 - a. Where they exist in the substrate or supporting construction
 - b. Where DEFS adjoins dissimilar construction or materials
 - c. Where substrate type changes
 - d. In continuous elevations at intervals not exceeding 25 ft and 625 sq ft for light colors (LRV > 70), and at intervals not exceeding 16 ft and every 256 sq ft for dark colors (LRV < 70 and > 30). Do not exceed length to width ratio of 2-1/2:1 in joint layout.
 - e. Where significant structural movement occurs such as changes in roofline, building shape or structural system.
 - f. Changes in building height
 - g. Floor lines
 - h. Wall penetrations.
3. Minimum joint size: 3/8 inch wide.

D. Grade Condition

1. DEFS below grade or surfaces subject to continuous or intermittent water immersion or hydrostatic pressure not acceptable.
2. Terminate DEFS minimum 8 -inches above finished grade.

E. Sloped Conditions

1. Use of DEFS on build-outs or weather exposed sloped and horizontal surfaces is not acceptable.

F. Moisture Control

1. DEFS does not offer moisture control; it is not to be used on moisture sensitive substrates or locations.
2. Provide flashing to direct water to the exterior where it is likely to penetrate components in the wall assembly.

1.10 PERFORMANCE REQUIREMENTS

- A. Building Structural Frame Movement Design Criteria: Obtain necessary projected data from Structural Engineer and make such provision in the work as may be necessary. Identify movement compliance on Shop Drawings.

February 27, 2026

1. Lateral Deflection
 2. Shrinkage and Creep
 3. Thermal movement.
 4. Differential foundation settlement: 1/4 in
- B. Wind Resistance: Withstand load effects of 150 percent (safety load) of inward positive and outward negative wind load design pressures, as calculated based on the most current ASCE 7 "Minimum Design Loads for Buildings and Other Structures", acting inward and outward normal to plane of wall according to ASTM E 330.
1. Wind Loading Criteria: As indicated on the Structural Drawings
- C. Air Infiltration Resistance Criteria:
1. Air Leakage not more than 0.06 cfm/sq ft at static air pressure differential at not less than 6.24 ft lbs/sq ft according to ASTM E 283.
- D. Water Penetration Resistance Criteria:
1. Show no evidence of uncontrolled water leakage at inward design wind load not less than 12.0 ft lbs/sq ft according to ASTM E 331 (Static) and AAMA 501.1 (Dynamic).
 2. Coordinate with adjacent exterior wall claddings and provide flashing to direct water to the exterior where it is likely to penetrate components in the wall assembly.
- E. Thermal Movement Resistance Criteria:
1. Withstand expansion and contraction movement of framing members and components without excessive thermal movement according to AAMA 501.5.
 2. Base calculations on actual surface temperatures due to both solar heat gain and nighttime sky heat loss.
 - a. Ambient Temperature Range: Plus 170 deg F to 40 deg F
 - b. Surface Temperature: 180 deg F.

1.11 DELIVERY, STORAGE, AND HANDLING

- A. Follow manufacturer's recommendations.
- B. Delivery: Deliver products in original unopened packages or containers, fully identified with intact and legible labels.
- C. Storage: Store materials inside under cover and off of floor. Protect from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other affects causing damage or deterioration. Storage temperature as recommended by product manufacturers.

1.12 FIELD CONDITIONS

- A. Warm Weather Requirements:
 1. Protect each coat of DEFS against uneven and excessive evaporation and from strong flows of dry air, both natural and artificial.

February 27, 2026

2. Apply and cure DEFS as required by climatic and job conditions to prevent dry out during cure period.
 3. Provide suitable coverings, moist curing, and barriers to deflect sunlight and wind, or combinations of these, as required.
- B. Protection During Work: Protect adjacent substrates from damage caused by application of cementitious materials.

1.13 WARRANTY

- A. Performance Special Warranty: Furnish repair and replacement warranty for a period of 5 years from date of substantial completion agreeing to repair or replace defects, faulty work and failures, signed by authorized representatives of Exterior Wall Contractor, Installer, and Manufacturer.
1. Warranty to include exploratory work to determine the cause of defective work during the guarantee period, at no additional cost.
 2. Continuing corrections to defective work beyond the 5 year guarantee period are required if initial corrective measures were executed per the requirements as noted above but later found to be inadequate and/or not acceptable after the specified 5 year guarantee period.
 3. Exterior Wall Contractor is responsible for damage to the building and furnishings occasioned by defective materials or workmanship or damage due to repair work.
- B. Defects, Faulty Work, and Failures: Include, but not limited to, following:
1. Excessive cracking due to thermal cycles or poor mixes.
 2. Sealant failure as specified in Section 07910.
 3. Air infiltration in excess of specified limits.
 4. Water penetration or condensation in excess of specified limits.
 5. Staining of exposed surfaces due to incompatibility of adjacent products.
 6. Failure to fulfill other specified performance requirements.
- C. Failure of finishes:
1. Cracking, peeling, crazing, pitting, or corroding discernible from a distance of 10 ft
 2. Color fading: N not more than 5 Hunter units according to ASTM D 2244 on exposed surfaces cleaned with clean water and soft cloth. Includes non-uniform fading to extent there are color differences between adjacent panels.
 3. Chalking: Not more than No. 8 rating according to ASTM D 4214 on exposed unwashed surfaces.
- D. Exceptions: Warranty does not cover damage resulting from vandalism, acts of nature exceeding performance criteria, failure of the supporting structure and other causes beyond the Exterior Wall Contractor's control.
- E. This warranty and its enforcement shall not deprive the Owner of other action right or remedy available to them.

PART 2 -PRODUCTS

2.01 MANUFACTURERS

A. Wall Application:

1. Basis of Design Manufacturer: The Drawings and Specifications are based on the DEFS system; StoQuik Finish for Concrete and CMU as manufactured by STO Corporation. Subject to compliance with requirements of Contract Documents, comparable DEFS systems by one of manufacturers named below are acceptable. If not named, submit as substitution according to Conditions of the Contract and appropriate Division 01 Sections.
 - a. Dryvit
 - b. Parex (www.parex.com)
 - c. Senergy (www.senergy.com)
 - d. Omega Products International
 - e. or Approved Equal

B. Soffit Application:

1. Basis of Design Manufacturer: The Drawings and Specifications are based on DEFS system: StoQuik Finish System for Soffits and Ceilings as manufactured by STO Corporation. Subject to compliance with the requirements of Contract Documents, comparable DEFS systems by one of manufacturers named below are acceptable. If not named, submit as substitution according to Conditions of the Contract and appropriate Division 01 Sections.
 - a. Dryvit
 - b. Parex (www.parex.com)
 - c. Senergy (www.senergy.com)
 - d. Omega Products International
 - e. or Approved Equal

2.02 MATERIALS, GENERAL

- A. Source Limitations for DEFS materials: Obtain materials from a single manufacturer for each cementitious component and from one source or producer for each aggregate.
- B. Material Compatibility: Provide primer, adhesive, insulation board, reinforcing mesh, base coat materials, finish coat materials, and accessories that are compatible with one another and approved for use by system manufacturer.
- C. Portland Cement:
 1. Product Quality Standard: ASTM C 150, Type I
 2. Color: Natural gray color or white cement as required producing color required.
- D. Water Resistive Barrier(**AWRB-1**):

February 27, 2026

1. Acrylic based, fiber-reinforced, flexible adhesive and waterproofing and recommended by DEFS manufacturer.
 - a. Basis of Design Product: Sto Flexyl.
- E. Transition Membranes
 1. Membrane Flashing: Self-adhered membrane flashing, rough opening protection, sheathing joint treatment, and transition detailing material; Sto Conformable Membrane.
 2. Transition Membrane: Flexible air and water-resistive barrier coating used to embed flexible membrane material; Sto Gold Coat and StoGuard Transition Membrane.
- F. Reinforcing Mesh: Balanced, alkali-resistant, open-weave glass-fiber mesh treated for compatibility with other EIFS materials, made from continuous multi-end strands with retained mesh tensile strength of not less than 145 lb/in and 150 lb/in in warp and fill directions per ASTM D 5035, complying with ASTM D 578 and the following requirements for minimum weight:
 1. Standard-Impact Reinforcing Mesh: Not less than 4.5 oz. /sq. yd. or greater.
 2. High Impact Resistant Reinforcing Mesh: Not less than 15 oz. /sq. yd. Provide heavy-duty mesh at locations from finish floor to 8'-0" above finish floor.
 3. Ultra-High Impact resistance reinforcing fabric: Comprised of two layers - 1 layer Standard Impact resistance reinforcing fabric of 4.5 oz /sq. yd. with a 2nd layer of High Impact resistance reinforcing fabric of 15 oz /sq. yd.
- G. Primer: (As required)
 1. System manufacturer's standard primer-sealer substrate conditioner designed to seal substrates from moisture penetration and to improve the bond between substrate and adhesive used for application of insulation.
- H. Base Coat:
 1. System standard mixture complying with the following:
 - a. Factory-mixed, fully formulated, acrylic polymer emulsion adhesive and inert fillers that is ready to use without the addition of other materials.
 - b. Base coats can be cement based or non-cementitious.
- I. Finish Coat: DEFS manufacturer's special acrylic-based coating, factory-mixed formulation of polymer-emulsion binder, colorfast mineral pigments, sound stone particles, and fillers:
 1. Sto Signature Impressions Systems:
 - a. Stolit X
 - b. Texture: Fine
 - c. Color: As indicated on drawings
- J. Water: Clean and potable.
- K. Sealants:

February 27, 2026

1. Comply with requirements of Section 07910 – EXTERIOR WALL JOINT SELANTS and manufacturer's recommendations.
 2. Class 100/50 Low Modulus: 1-Part, neutral cure, non-sag, non-bleeding silicone sealant.
 3. Backer rod: Closed-cell polyethylene foam.
- L. Mechanical fasteners: fasteners used to attach accessories must be corrosion resistant.

2.03 MISCELLANEOUS MATERIALS

- A. Sheet Metal Flashing: Required within the system or to join the system to adjacent construction, one of following:
1. Aluminum Sheet, ASTM B 209 not less than 1/16 in thick at exposed applications.
 2. Galvanized Steel Sheet, ASTM A 653 G90, not less than 1/32 -inch at concealed applications.
 3. Stainless steel:
 - a. Description: 2D annealed finish, not less than 0.018-inch (26 ga) thick, unless noted otherwise.
 - b. Product Quality Standard: ASTM A 167 Type 302, 318.
- B. Patching and Leveling Material for Concrete and Masonry
1. Polymer modified Portland cement-based patch and leveling material for prepared concrete and masonry surfaces for leveling up to 1/4 inch; Sto Leveler and Skim Coat.
 2. Polymer modified Portland cement-based lightweight patch and leveling material for prepared concrete and masonry surfaces for leveling up to 1/8 inch; Sto BTS Xtra.
- C. Crack Fillers: Substrate manufacturer's recommended crack fillers or sealants compatible with air barrier assembly components and adjacent materials.
- D. Gypsum Soffit Board: Glass mat faced gypsum sheathing in compliance with ASTM C1177 as recommended by Manufacturer.

2.04 METAL FLASHING FABRICATION

- A. Fabrication Quality Standards: In addition to standards listed elsewhere, comply with following, unless otherwise specified:
1. SMACNA – Architectural Sheet Metal Manual.
 2. Approved submittals.
 3. Contract Documents.
- B. Fabrication Procedures: Fabricate continuous flashings in sections 96-inches long minimum, but not exceeding 144-inches. Provide splice plates at joints of formed, smooth metal flashing.

February 27, 2026

- C. Flashing Joinery: Fabricate interior and exterior corners, intersections, and complex flashing conditions in shop, with properly folded, constructed and continuous soldered joints.

PART 3 -EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of DEFS.
 - 1. Approved substrates for DEFS Installation:
 - a. Concrete and masonry: Dry and cured a minimum of 28 days.
 - i. Poured-in-place and precast concrete.
 - ii. Unglazed brick and masonry units
 - 2. Coordinate to provide a continuous moisture protection. Provide protection of rough openings before installing windows, doors, and other penetrations through the wall and provide sill flashing. Coordinate installation of air/moisture barrier components with window and door installation to provide weather proofing of the structure and to prevent moisture infiltration and excess air infiltration.
 - 3. The water resistive air barrier shall be continuous behind accessories and across dissimilar substrates. Coordinate the interface of water restive air barriers between the DEFS.

3.02 PREPARATION

- A. Substrate Condition:
 - 1. Commence installation after completion of all floor, roof construction and other construction that imposes dead loads on the walls to prevent excessive deflection (and potential cracking) of the substrate.
 - 2. Ensure substrate surface is smooth and flat without protrusions that will affect thickness of DEFS. Plane tolerance not be more than 1/4 in in 10 ft.
 - 3. Substrates be free of oil, dust, dirt, form-release agents, efflorescence, paint, wax, water repellents, moisture, frost and any other materials that inhibit adhesion.

3.03 INSTALLATION, GENERAL.

- A. Installation Performance Requirements: Ensure air/water barrier isolates building interiors from air and water infiltration through exterior walls.
- B. Installation Quality Standards: In addition to standards listed elsewhere, perform work according to following, unless otherwise specified:
 - 1. ASTM C 1397
 - 2. ASTM C 1516
 - 3. Respective manufacturer's written installation instructions.

February 27, 2026

4. Approved submittals.
5. Contract Documents.

3.04 INSTALLING AIR-WATER BARRIER

- A. Air/Moisture Barrier over Concrete or Concrete Masonry Unit (CMU) surfaces:
1. Repair cracks on surface with product recommended by air/moisture barrier manufacturer.
 2. Apply waterproof coating by roller or spray equipment to a minimum wet thickness of 10 mils each and up to a total maximum of 30 mils depending on surface condition. Additional coats may be necessary to provide a void and pinhole free surface. Protect from weather until dry.
 3. Provide a complete Air/Moisture Barrier System by coordinating with air/moisture barrier of adjacent construction and the incorporation of flashing and moisture protection components.

3.05 INSTALLATION OF DEFS SYSTEM

- A. Base Coat Application:
1. Apply detail mesh at trim, reveals and projecting architectural features. Embed the mesh in the wet base coat. Trowel from the base of reveals to the edges of the mesh.
 2. Apply base coat to the recommended thickness prior to embedding the reinforcing mesh. Fully embed the mesh within the wet base coat to produce wrinkle-free installation. Reinforcing fabric pattern must not be visible.
 3. Include diagonal mesh patches at corners of openings and reinforcing mesh patches at joints of track sections.
 4. Reinforcing mesh must have no less than 2-1/2 in overlap in each direction with the mesh that follows. Do not overlap high impact mesh; butt only.
 5. Reinforcing mesh must be continuous at all corners and not lapped within 8 in of any corner. Double-wrap inside and outside corners.
 6. Base coat dry thickness over insulation must not be less than 1/16 in up to 1/4 in, depending upon the number of reinforcing mesh layers.
 7. Install high impact mesh where indicated in Contract Drawings and as recommended for high traffic areas and areas exposed to impact damage.
- B. Finish Coat:
1. Allow base coat to cure/dry for no less than 24 hrs. If required by Manufacturer, apply primer to base coat after drying.
 2. Apply finish coat over dry base coat in thickness required by system manufacturer to produce a uniform finish of texture and color matching approved sample.
 3. Continue finish coat around corners at edges of panels unless otherwise indicated. Do not extend finish coat over surfaces where sealant will be applied.

February 27, 2026

- 4. Maintain adequate air ventilation and circulation for a minimum of 48 hrs, or until the products are completely dry.
- C. Horizontal Installation: Not allowed
- D. Attach penetrations through DEFS to structural support and provide water tight seal at penetrations.
- E. Do not install wet materials during inclement weather. Temperature limitations during application and curing per Manufacturer's recommendations. Protect materials from inclement weather until they are completely dry.
- F. Exposed DEFS Quality: Finish shall be free of hairline cracks, rough areas, trowel marks, checks, or other blemishes and imperfections. Finish coat texture and color to match Architect's samples.
- G. Installation Tolerance: Variation in surface flatness of exposed plaster not more than 1/8 in in 10 ft in any direction.

3.06 SEALANTS

- A. Comply with Section 07910 - EXTERIOR WALL JOINT SEALANTS and ASTM C 1481.
- B. Weather sealant lines between DEFS panels shall be applied directly to the DEFS base coat, and not to the finish coat.
- C. Apply primer if recommended as a result of sealant manufacturer's testing.
- D. cost to Owner, due to failure of work to pass testing and inspections.

3.07 ADJUSTING

- A. Repair and recoat damaged DEFS to eliminate cracks and similar imperfections. Repair work to be previously approved by the Architect and executed following manufacturer's written instructions.

3.08 PROTECTION AND CLEANING

- A. Provide protection of installed materials until DEFS is fully cured and dry.
- B. Remove materials from the job site in accordance with contract provisions and as required by law. Job site must be left free of debris and foreign substances resulting from the contractor's work.

3.09 ACCEPTANCE

- A. Areas or materials which are damaged, or which in the opinion of the Architect do not conform to the specification requirements, shall be removed and replaced with acceptable material at no additional cost to the Owner.
- B. Demonstrate proper cleaning methods and materials to Owner's maintenance personnel.
- C. Provide "as built" shop drawings and maintenance manuals per requirements of the project documents.

END OF SECTION

February 27, 2026

SECTION 07250 – FLUID-APPLIED AIR AND WATER RESISTIVE BARRIERS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Fluid-applied silicone vapor permeable, air and water resistive barrier membrane for use behind aluminum composite metal wall panels as indicated on the Drawings.
2. Liquid flashings and preformed silicone detailing and transitioning strips.

B. Related Requirements:

1. Section 05400 – COLD-FORMED METAL FRAMING
2. Section 06160 – EXTERIOR GYPSUM SHEATHING
3. Section 07415 – ALUMINUM COMPOSITE WALL PANELS
4. Section 07910 – EXTERIOR WALL JOINT SEALANTS

1.02 DEFINITIONS

- A. Air Barrier: Material or assembly of materials that can reduce and control the air flow between conditioned space and unconditioned space.
- B. Water Resistive Barrier: Materials that resist bulk water penetration and wind-driven rain that penetrates the exterior cladding from intruding into the wall assembly.

1.03 REFERENCES

A. ASTM International (ASTM):

1. ASTM C920 - Standard Specification for Elastomeric Joint Sealants.
2. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension.
3. ASTM D 1970 - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
4. ASTM D4541 – Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers.
5. ASTM E84 - Test Method for Surface Burning Characteristics of Building Materials.
6. ASTM E96 – Standard Test Methods for Water Vapor Transmission of Materials.
7. ASTM E398 Standard Test Method for Water Vapor Transmission Rate of Sheet Materials Using Dynamic Relative Humidity Measurement.
8. ASTM E2178 - Standard Test Method for Air Permeance of Building Materials.

February 27, 2026

9. ASTM E2357 - Standard Test Method for Determining Air Leakage of Air Barrier Assemblies.
10. ASTM E283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
11. ASTM E330 – Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
12. ASTM E331 – Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.

1.04 PERFORMANCE REQUIREMENTS

- A. Air and water resistive barrier shall be capable of performing as a continuous vapor-permeable air barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. Air and water resistive barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, and transitions at perimeter conditions without deterioration and air and water leakage exceeding specified limits.
- B. Air and water resistive barrier shall be joined in an airtight and flexible manner to the air and water resistive barrier materials of adjacent systems, allowing for the relative movement of systems due to thermal and moisture variations, creep and anticipated seismic movement.
- C. Air Infiltration: Air and water resistive barrier membrane shall have an air permeability not to exceed 0.004 cfm/sq. ft. under a pressure differential of 0.3 in. water. (1.57 psf) (equal to 0.02L/sq. m @ 75 Pa), when tested in accordance with ASTM E 2178.
- D. Assembly Performance:
 1. Assembly shall be capable of withstanding the wind load design pressures as specified in Section 07415 – ALUMINUM COMPOSITE WALL PANELS and shall provide a continuous air barrier in the form of an assembly that has an air leakage not to exceed 0.06 cubic feet per minute per square foot under a pressure differential of 6.24 pounds per square foot when tested in accordance with ASTM E2357.
 2. The assembly shall accommodate movements of building materials by providing expansion and control joints as required. Expansion / control joints, changes in substrate and perimeter conditions shall have appropriate accessory materials at such locations.
 3. The air and water resistive barrier membrane shall be capable of withstanding combined design wind, fan and stack pressures, both positive and negative on the envelope without damage or displacement and shall transfer the load to the structure.
 4. Fluid applied air and water resistive barriers shall not displace adjacent materials in the air barrier assembly under full load.

February 27, 2026

5. Assembly water penetration resistance shall not be less than the values specified in Section 07415 – ALUMINUM COMPOSITE WALL PANELS.
 - a. No water penetration on the interior side of the exterior sheathing, stud framing, support structure or masonry substrate within the extent of the air barrier assembly or joints at openings.
 - b. There shall be no deleterious effects to membrane after 14 days of exposure to water when tested in accordance with ASTM D2247.
 - 1) Deleterious effects would include cracking, checking, erosion or other characteristics that would affect membrane's ability to resist liquid water.
- E. Water Vapor Permeance, ASTM E96: Not less than 10 perms.
- F. Surface-Burning Characteristics: Provide air and water resistive barrier coatings that achieve flame-spread index of 25 or less and smoke-developed index of 450 or less per ASTM E 84.
- G. Fire Propagation Characteristics: Provide air barrier coatings and accessory materials that are tested for compliance with NFPA 285 when used as part of an exterior wall assembly identical to that required for Project.
 1. When testing of identical wall assembly is not available, provide engineering judgment by qualified third-party testing agency acceptable to authorities having jurisdiction demonstrating equivalent compliance with requirements.
- H. UV Exposure and Resistance: Not less than 5000 hr exposure when tested in accordance with ASTM G 154.
- I. Service Temperature Range: Capable of withstanding wall drainage cavity temperatures of up to 300 degrees F.

1.05 SUBMITTALS

- A. Product Data: Include manufacturer's written instructions for evaluating, preparing, and treating substrate; technical data; written installation instructions and tested physical and performance properties of weather barrier.
- B. Shop Drawings: Provide coordinated shop drawing in conjunction with the wall assemblies specified in Section 07415 – ALUMINUM COMPOSITE WALL PANELS. Show locations and extent of air and water resistive barrier. Include details for substrate joints and cracks, counterflashing strip, penetrations, inside and outside corners, terminations, and tie-ins with adjoining construction.
 1. Include details of interfaces with other materials that form part of air and water resistive barrier.
 2. Include details of mockups.
- C. Product Certificates: For air and water resistive barriers, certifying compatibility of air and water resistive barrier and accessory materials with Project materials that connect to or that come in contact with air and water resistive barrier; signed by product manufacturer.
- D. Qualification Data: For Applicator.

February 27, 2026

- E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for air and water resistive barriers showing compliance with performance requirements where test methods are indicated, and in compliance with ASTM E329.
- F. Field Quality Control Test Reports: Reports of testing and inspection specified in PART 3 "Field Quality Control" Article.
- G. Manufacturers Field Inspection Reports: Reports of each visit to Project made by representatives of manufacturer specified in PART 3 "Field Quality Control" Article.
- H. Manufacturer's sample warranty.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications

- 1. Weather barrier systems shall be manufactured and marketed by a firm with a minimum of 10 years' experience in the production and sales of waterproofing, air and weather barriers.
- 2. Manufacturers proposed for use, but not named in these specifications shall submit evidence of ability to meet all requirements specified and include a list of projects of similar design and complexity completed within the past five years.

B. Installer Qualifications

- 1. Installer shall have minimum ten (10) years experience with installation of similar air and water resistive barrier assemblies under similar conditions.
- 2. Installation shall be in accordance with manufacturer's installation guidelines and recommendations.
- 3. Source Limitations: Provide weather barrier and accessory materials produced by single manufacturer.

C. Single source responsibility: Obtain materials for air and water resistive barrier membrane systems from either a single manufacturer or from manufacturers approved by the system manufacturer as being compatible with other system components.

D. Preconstruction Testing: Prior to application of air and water resistive barrier coatings, perform the following tests to verify condition of substrate in accordance with manufacturer's instructions.

- 1. Adhesion: Perform substrate field adhesion tests on each substrate to determine if primer is required to satisfactorily adhere air and water resistive barrier coatings to substrates.
- 2. Alkalinity: Verify substrate is within alkalinity range acceptable to manufacturer.
- 3. Moisture Level: Verify substrate moisture content is acceptable to manufacturer. Verify substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263.

E. Mockups: Before beginning installation of air and water resistive barrier, provide air and water resistive barrier work for exterior wall assembly mockups,

February 27, 2026

incorporating backup wall construction, external cladding, window, door frame and sill, insulation, and flashing to demonstrate surface preparation, crack and joint treatment, and sealing of gaps, terminations, and penetrations of air barrier membrane.

1. Coordinate construction of mockup to permit inspection by the Architect before cladding system is installed.
 2. If the Architect determines mockups do not comply with requirements, reconstruct mockups and apply air and water resistive barrier until mockups are approved.
- F. Pre-Installation Conference: A pre-installation conference shall be held prior to commencement of field operations to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work. Pre-installation conference shall include the Owner, Construction Manager, Contractor, installer, Architect, and system manufacturer's field representative.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Deliver air and water resistive barrier materials and components in manufacturer's original, unopened, undamaged containers with identification labels intact.
- B. Store air and water resistive barrier materials as recommended by system manufacturer.
- C. Protect from damage from sunlight, weather, excessive temperatures and construction operations. Remove damaged material from the site and dispose of in accordance with applicable regulations.

1.08 PROJECT CONDITIONS

- A. Environmental Limitations: Apply air and water resistive barrier within the range of ambient and substrate temperatures recommended by air and water resistive barrier manufacturer. Protect substrates from environmental conditions that affect performance of air and water resistive barrier. Do not apply air and water resistive barrier to a wet substrate or during rain, fog, or mist.

1.09 COORDINATION

- A. Review requirements for sequencing of installation of air and water resistive barrier assembly with installation of windows, doors, louvers and flashings to provide a weather-tight barrier assembly.
- B. Ensure continuity of the fluid-applied air and water-resistive barrier system throughout the scope of this section.

1.10 WARRANTY

- A. Manufacturer's Special Warranty: Submit manufacturer's warranty that air and water resistive barrier and accessories are free of defects at time of delivery and are manufactured to meet manufacturer's published physical properties and material specifications.

1. Defects, Faulty Workmanship and Failure

February 27, 2026

- a. Thermal movement causing damage or deterioration to air barrier and components.
 - b. Sealant failure as specified in Section 07910 -EXTERIOR WALL JOINT SEALANTS.
 - c. Air infiltration in excess of specified limits.
 - d. Water penetration or condensation in excess of specified limits.
 - e. Staining of exposed surfaces due to incompatibility of adjacent products.
 - f. Failure in adhesion, cohesion, abrasion-resistance, migration-resistance, stain-resistance, general durability, color stability or any other form of apparent deterioration.
 - g. Failure to fulfill other specified performance requirements.
- B. Warranty Period: Fifteen (15) years from the Substantial Completion date.

PART 2 - PRODUCTS

2.01 SILICONE AIR AND WATER-RESISTIVE BARRIER

- A. Basis-of-Design Air and Water Resistive Barrier: Fluid-applied, water-based, vapor-permeable, one-component silicone elastomeric coating. DOWSIL™ DefendAir 200C Silicone Liquid-Applied Air and Weather Barrier manufactured by The Dow Chemical Company.
1. Subject to compliance with requirements and Architects approved, the following products may be acceptable:
 - a. GE Elemax 2600 AWB; Momenite..
 - b. or approved equal.
- B. Silicone Elastomer Weather Barrier Transition Strips: Highly-flexible clear flashing and transition sheet with pre-molded corner accessory pieces for bonding to weather barrier substrates and to adjacent curtain wall, storefront, and window frames and other transition substrates using silicone sealant. DOWSIL Silicone Transition Strip; (STS).
1. Subject to compliance with requirements and Architects approved, the following products may be acceptable:
 - a. GE UST2200 UltraSpan, GE USM UltraSpan molded corners; Momenite..
 - b. or approved equal.
- C. Silicone Elastomer Seals: Highly flexible low-modulus flashing and transition material for bonding to substrates with silicone sealant. SWRI validated.
1. Product: DOWSIL™ 123 Silicone Seal.
 2. Bonding Sealant: Manufacturer's recommended neutral-curing silicone.
 3. Hardness, ASTM D 2240: 25 durometer Shore A, minimum.
- D. Detail Joint and Bonding Sealant: ASTM C 920, single-component, neutral-curing silicone, Grade NS, SWRI-validated, of Class indicated, compatible with adjacent

February 27, 2026

materials. Provide products recommended by air barrier manufacturer for application.

1. Class 25: Product: DOWSIL™ 758 Silicone Weather Barrier Sealant.
2. Class 50: Product: DOWSIL™ 791 Silicone Weatherproofing Sealant.
3. Class 50: Product: DOWSIL™ 795 Silicone Building Sealant.
4. Class 50: Product: DOWSIL™ 756 SMS Building Sealant.

2.02 MISCELLANEOUS MATERIALS

- A. Crack Fillers: Substrate manufacturer's recommended crack fillers or sealants compatible with air barrier assembly components and adjacent materials.
- B. Primer: Air barrier coating manufacturer's recommended, factory-formulated, alkali-resistant primer compatible with substrate and adjacent materials.
- C. Metal Wall Flashing: As specified in Section 07600 – FLASHING AND SHEET METAL.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that substrates and conditions are ready to accept the Work of this section. Notify the Architect in writing of any discrepancies. Commencement of the Work or any parts thereof shall mean acceptance of the prepared substrates.
- B. All surfaces must be sound, dry, clean and free of oil, grease, dirt, excess mortar or other contaminants detrimental to the adhesion of the membranes. Fill voids, gaps and spalled areas in substrate to provide an even plane. Strike masonry joints full-flush.
- C. Ensure all preparatory Work is complete prior to applying fluid-applied air and water resistive barrier membrane.

3.02 SURFACE PREPARATION

- A. Refer to manufacturer's literature for requirements for preparation of substrates. Surfaces shall be sound and free of voids, spalled areas, loose aggregate and sharp protrusions. Remove contaminants such as grease, oil and wax from exposed surfaces. Remove dust, dirt, loose stone and debris. Use repair materials and methods that are acceptable to manufacturer of the air and water resistive barrier assembly.
- B. Exterior Sheathing Joints: Ensure that exterior sheathing boards are sufficiently stabilized with corners and edges fastened with appropriate screws. Pre-treat all board joints with 3-inch to 4-inch wide, reinforced self-adhesive tape or fiberglass mesh style wallboard tape.
 1. Gaps no larger than 1/4-inch should be filled with approved sealant.
 2. Gaps greater than 1/2-inch should be sealed with approved sealant and bond breaker, reinforced fabric or silicone membrane, as recommended.

February 27, 2026

3. Pre-treat over-driven screws and abandoned screw holes as recommend screw misses stud, leave in, do not remove.
 4. Allow sufficient time to fully cure before application of fluid applied air and water resistive barrier.
- C. Protection: Protect adjacent surfaces not designated to receive air and water resistive barrier coatings. Provide protection for pedestrians, vehicles, landscaping, and surrounding areas to prevent contact with coating materials.
- D. Primer: Apply primer to substrates where required based upon preinstallation testing and air and water resistive barrier coating manufacturer's recommendations, using application methods and rate of application recommended by manufacturer. Allow to dry prior to application of air and water resistive barrier coating.

3.03 AIR AND WATER RESISTIVE BARRIER MEMBRANE INSTALLATION

- A. Install air and water resistive barrier membrane in accordance with the membrane manufacturer's recommendations and installation instructions to achieve a continuous air and water resistive barrier.
- B. Transition Strips and Elastomer Seals:
1. Follow Manufacturer's instructions for recommended accessory material for each type of job condition.
 2. Treat sheathing joints, expansion joints, rough openings, transitions, terminations, corners, penetrations and surface irregularities as recommended by membrane Manufacturer. Transitions and detailing can be performed before or after the air and water resistive barrier membrane application.
 3. Connect and seal accessory materials to adjoining components of building, including but not limited to:
 - a. Air and water resistive barrier of adjacent wall cladding based on compatibility and adhesion testing..
 - b. Roof membrane system.
 - c. Below grade or above grade waterproofing system.
 - d. Perimeter metal flashings at openings or metal flashings used to bridge between incompatible adjacent materials.
 - e. Penetrations: Seal around penetrations with approved sealant. At anchors and fastener penetrations, install a strip of self-adhered membrane or product recommended by manufacturer behind anchors to ensure air and water tightness.
 - f. Silicone pre-molded corners: Apply sealant and trowel thin. Seat piece into the sealant, lapping 2 inches minimum with shingled laps. Edges to be completely embedded in sealant.
 - g. Corners: Extend accessory materials minimum 3 inches onto vertical wall and into rough opening.
 - h. Self-adhered Flashing Edges: All exposed cut edges of flashing to be rolled flat and sealed.

February 27, 2026

- i. Through-Wall Flashing: Seal top of through-wall flashing to air barrier. Where self-adhered membrane through-wall flashing is installed over the top of the fluid-applied membrane, install a continuous metal termination bar over the sealed exposed top.

C. Fluid-Applied Air and Water Resistive Barrier Membrane Application

1. Apply using nap roller or airless sprayer approved by membrane manufacturer, in a continuous uniform film at minimum wet film thickness recommended by manufacturer using multiple, overlapping passes.
2. When spraying use a cross-hatching technique (alternating horizontal and vertical passes) to ensure even thickness and coverage.
3. Periodically check wet film thickness of installed membrane during installation to ensure compliance with Manufacturer's installation instructions.
4. Apply additional coats when required to provide uniform, continuous cured airtight and watertight film.
5. Carry membrane into rough openings, terminations, penetrations and other transitions as directed by manufacture.

3.04 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform inspections and field performance tests, including documenting of air and water resistive barrier system installation prior to concealment, including:
1. Continuous structural support of air barrier system has been provided.
 2. Compatibility of materials within air barrier system and with adjoining materials.
 3. Exterior sheathing exposed surfaces are smooth, clean, dry and intact with no visible damage with all joints sealed and/or taped.
 4. All required penetrations through air barrier system, including those required under different scope of work, are in place in exterior wall surface and ready for membrane application.
 5. Site conditions for application temperature and dryness of substrates have been maintained for time period set by Manufacturer for optimal installation.
 6. Surface preparation meets requirements.
 7. Surfaces have been primed, if applicable.
 8. Continuity of air barrier system has been achieved throughout the opaque wall area with no gaps or holes.
 9. Wet and dry film thickness of fluid-applied membrane complies with Manufacturer's recommended minimum thickness.
 10. Connections between assemblies (metal flashing at openings, roof membrane, other air and water resistive barriers of adjacent wall cladding, waterproofing, and weather seals with air barrier system) are in compliance with approved shop drawing requirements and that continuity of seal has been maintained.

February 27, 2026

11. Laps in self-adhered transition membrane strips and through-wall flashing membranes have complied with minimum requirements set by Manufacturer and have been shingled in the correct direction, with no fishmouths.
12. All self-adhered membranes have been firmly adhered to substrate and all exposed cut edges have been encapsulated with Manufacturer approved sealant. Sealant to be tooled to membrane surfaces to ensure adhesion.
13. Transitions at changes in direction and structural support at gaps have been provided and all anticipated movements accommodated.
14. All penetrations have been sealed in accordance with approved shop drawings and Manufacturer's recommendations.
15. Maximum exposure time of materials to UV deterioration has not been exceeded. Those materials which exceed maximum exposure time will have to be replaced or recovered in accordance with Manufacturer's written recommendations.

B. Manufacturer's Field Inspection:

1. Inspect installation at 14-day maximum intervals during construction and 1 at completion of installation.
2. Identify areas or conditions where installation does not comply with Manufacturer's recommended installation procedure and provide recommended corrective measures for compliance and warranty.
3. Write field report to include location inspected, weather conditions and quality of work; record times of application, ambient temperatures, substrate temperatures, and procedures followed to address heat/cold conditions.
4. Inspections shall include cutting samples to check millage thickness of coatings, and repair sample cut areas.

C. Field Performance Testing: Comply with the field-testing requirements specified under "Field Quality Control" article in Part 3 of Section 07460 – ALUMINUM COMPOSITE WALL PANELS.

D. If testing indicates products or work do not meet requirements, Owner may stop work and require Contractor to remove non-complying materials and materials applied over non-complying substrates, and otherwise correct application at no additional cost to the Owner.

3.05 CLEANING AND PROTECTION

- A. Protect weather barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.
- B. Protect weather barrier from exposure to UV light and harmful weather exposure as required by manufacturer. Remove and replace weather barrier membrane exposed for more than the duration allowed by the manufacturer.
- C. Clean spills, stains, and soiling from construction that would be exposed in the completed work using cleaning agents and procedures recommended by manufacturer of affected construction.
- D. Clear weep holes and drainage channels of obstructions and dirt.

February 27, 2026

E. Remove masking materials after installation.

END OF SECTION

SECTION 07270 - PENETRATION FIRESTOPPING

PART 1 - GENERAL

1.01 SUMMARY

- A. Work includes through-penetration firestop systems for penetrations through fire-resistance-rated constructions, including both empty openings and openings containing penetrating items.
- B. Related Work Described Elsewhere:
 - 1. Section 09250 – GYPSUM BOARD ASSEMBLIES.
 - 2. Division 15 - MECHANICAL.
 - 3. Division 16 – ELECTRICAL.

1.02 REFERENCES

- A. ASTM E 84 Test Method for Surface Burning Characteristics of Building Materials
- B. UL-05 Underwriters Laboratory, Inc. Fire Resistance Directory.
- C. UL 2079 Standard Tests for Fire Resistance of Building Joint Systems.
- D. ASTM E 119 Fire Tests of Building Construction and Materials.
- E. UL 1497 Fire Tests of Through-Penetration Firestops.
- F. NFPA 70 National Electrical Code.
- G. 2018 International Building Code (IBC) with Kauai County Amendments.

1.03 PERFORMANCE REQUIREMENTS

- A. Select and provide through-penetration firestop systems test by Underwriters Laboratories or another qualified testing and inspection agency to resist spread of fire according to requirements indicated, resist passage of smoke and other gases and maintain the fire resistance rating of the construction penetrated as determined by UL 1497.
 - 1. F-Rated Systems: Provide through-penetration firestop systems with F-ratings indicated, but not less than that equaling, or exceeding fire-resistance rating of constructions penetrated.
 - 2. T-Rated Systems: For the following conditions, provide through-penetration firestop systems with T-ratings indicated, as well as F-ratings, where systems protect penetrating items exposed to potential contact with adjacent materials in occupiable floor areas:
 - a. Penetrations located outside wall cavities.
 - b. Penetrations located outside fire-resistance-rated shaft enclosures.
 - c. Penetrations located in construction containing fire protection rated openings.
 - d. Penetrating items larger than 4-inches in diameter nominal pipe or 16 square inch in overall cross-sectional area.

- B. For through-penetration firestop systems exposed to view, traffic, moisture, and physical damage, provide products that, after curing, do not deteriorate when exposed to these conditions both during and after construction.
 - 1. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.
 - 2. For floor penetrations with annular spaces exceeding 4-inches in width and exposed to possible loading and traffic, provide firestop systems capable of supporting floor loads involved, either by installing floor plates or by other means.
 - 3. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.
- C. For through-penetration firestop systems exposed to view, provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.
- D. Select and Provide fire resistive joint systems test by Underwriter's Laboratories or other qualified testing and inspecting agency to resist spread of fire, resist passage of smoke and other gases, and maintain the fire resistance rating of the construction penetrated and, where applicable, UL 1497 and UL testing standard 2079.

1.04 SUBMITTALS

- A. Product Data: For each through-penetration firestop system indicated submit documentation, including illustrations, from Underwriter's Laboratories or other certified testing and inspecting agency. Submit data for the component products of the selected systems.
- B. Shop Drawings: For each through-penetration firestop system, show each type of construction condition penetrated, relationships to adjoining construction, and type of penetrating item. Include firestop design designation of qualified testing and inspecting agency that evidences compliance with requirements for each condition indicated.
 - 1. Submit documentation, including illustrations, from a qualified testing and inspecting agency that is applicable to each through-penetration firestop system configuration for construction and penetrating items.
 - 2. Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular through-penetration firestop condition, submit illustration, with modifications marked, approved by through-penetration firestop system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.
- C. Through-Penetration Firestop System Schedule: Indicate locations of each through-penetration firestop system, along with the following information:
 - 1. Types of penetrating items.
 - 2. Types of constructions penetrated, including fire-resistance ratings and, where applicable, thicknesses of construction penetrated.

3. Through-penetration firestop systems for each location identified by firestop design designation of qualified testing and inspecting agency.
- D. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, name and addresses of the architects and owners, and other information specified.
- E. Product Certificates: For through-penetration firestop system products, signed by product manufacturer.
- F. Product Test Reports: From a qualified testing agency indicating through-penetration firestop system complies with requirements, based on comprehensive testing of current products.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: A firm experienced in installing through-penetration firestop systems similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful performance. Qualifications include having the necessary experience, staff, and training to install manufacturer's products per specified requirements. Manufacturer's willingness to sell its through-penetration firestop system products to Contractor or to Installer engaged by Contractor does not in itself confer qualification on buyer.
- B. Source Limitations: Obtain through-penetration firestop systems, for each kind of penetration and construction condition indicated, through one source from a single manufacturer.
- C. Fire-Test-Response Characteristics: Provide through-penetration firestop systems that comply with the following requirements and those specified in Part 1 "Performance Requirements" Article:
 1. Firestopping tests are performed by Underwriter's Laboratories (UL).
 2. Through-penetration firestop systems are identical to those tested per ASTM E 814. Provide rated systems complying with the following requirements:
 - a. Through-penetration firestop system products bear UL classification marking.
 - b. Through-penetration firestop systems correspond to those indicated by reference to through-penetration firestop system designations listed by the following:
 - i. UL in its "Fire Resistance Directory."
- D. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Section 01310 – PROJECT MANAGEMENT AND COORDINATION. The manufacturer's technical representative must attend.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver through-penetration firestop system products to Project site in original, unopened containers or packages with intact and legible manufacturers' labels identifying product and manufacturer, date of manufacture, lot number, shelf life

February 27, 2026

if applicable, qualified testing and inspecting agency's classification marking applicable to Project, curing time, and mixing instructions for multicomponent materials.

- B. Store and handle materials for through-penetration firestop systems to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

1.07 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install through-penetration firestop systems when ambient or substrate temperatures are outside limits permitted by through-penetration firestop system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.
- B. Ventilate through-penetration firestop systems per manufacturer's written instructions by natural means or, where this is inadequate, forced-air circulation.

1.08 COORDINATION

- A. Coordinate construction of openings and penetrating items to ensure that through-penetration firestop systems are installed according to specified requirements. Coordination includes but not limited to:
 - 1. Offsetting the penetrating item from parallel walls, ceilings or from other penetrating items so that the penetration details match the tested design on all sides.
 - 2. Rerouting the penetrating item so the item penetrates the rated barrier at a 90-degree angle or at an angle sufficiently great to stay within the limits of the tested design.
- B. Limiting the size of sleeves, openings, core-drilled holes, or cut openings so that the annular space remaining between the penetrating item and the surrounding construction does not exceed that of the tested design.
- C. Do not cover up through-penetration firestop system installations that will become concealed behind other construction until each installation has been examined by a building inspector, if required by authorities having jurisdiction.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide one of the through-penetration firestop systems indicated for each application that are produced by one of the following manufacturers:
 - 1. Hilti, Inc.
 - 2. Isolatek International
 - 3. Nelson Firestop Products.
 - 4. PABCO Gypsum
 - 5. Specified Technologies Inc.

6. 3M; Fire Protection Products Division.
7. Tremco; Sealant/Weatherproofing Division.

2.02 FIRESTOPPING, GENERAL

- A. Asbestos Prohibition: No materials or equipment containing asbestos shall be used under this section. Assure that all materials and equipment used in the project are asbestos free.
- B. Provide penetration firestopping that is produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated.
- C. Compatibility: Provide through-penetration firestop systems that are compatible with one another; with the substrates forming openings; and with the items, if any, penetrating through-penetration firestop systems, under conditions of service and application, as demonstrated by through-penetration firestop system manufacturer based on testing and field experience.
- D. Penetrations in Fire-Resistance-Rated Walls: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.
 1. F-Rating: Not less than the fire-resistance rating of constructions penetrated.
- E. Penetrations in Horizontal Assemblies: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.
 1. F-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated.
 2. T-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated except for floor penetrations within the cavity of a wall.
- F. Accessories: Provide components for each through-penetration firestop system that are needed to install fill materials and to comply with Part 1 "Performance Requirements" Article. Use only components specified by through-penetration firestop system manufacturer and approved by qualified testing and inspecting agency for firestop systems indicated.
 1. Permanent forming/damming/backing materials, including the following:
 - a. Slag-wool-fiber or rock-wool-fiber insulation.
 - b. Fillers for sealants.
 2. Temporary forming materials.
 3. Substrate primers.

2.03 FILL MATERIALS

- A. Mortars: ASTM E 814, Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers and lightweight aggregate

formulated for mixing with water at the Project site to form a non-shrinking, homogeneous mortar.

1. Acceptable Products:

- a. CP 637 Firestop Mortar; Hilti, Inc.
- B. Intumescent Sealants: Single component intumescent latex formulations containing no water-soluble intumescent ingredients capable of expanding a minimum 8 times.
- C. Intumescent Putties: Non-hardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds for protection of electrical switch and receptacle boxes to reduce horizontal separation to less than 24-inches and allow for back-to-back conditions.
- D. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.
- E. 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, and non-sag formulation for openings in vertical and sloped surfaces, unless indicated firestopping limits use of non-sag grade for both opening conditions.

2.04 MIXING

- A. For those products requiring mixing before application, comply with through-penetration firestop system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of work.
 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Surface Cleaning: Clean out openings immediately before installing through-penetration firestop systems to comply with firestop system manufacturer's written instructions and with the following requirements:
 1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of through-penetration firestop systems.

2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with through-penetration firestop systems. Remove loose particles remaining from cleaning operation.
 3. Remove laitance and form-release agents from concrete.
- B. Priming: Prime substrates where recommended in writing by through-penetration firestop system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.
- C. Masking Tape: Use masking tape to prevent through-penetration firestop systems from contacting adjoining surfaces that will remain exposed on completion of Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestop system materials. Remove tape as soon as possible without disturbing firestop system's seal with substrates.

3.03 THROUGH-PENETRATION FIRESTOP SYSTEM INSTALLATION

- A. General: Install through-penetration firestop systems to comply with Part 1 "Performance Requirements" Article and with firestop system manufacturer's written installation instructions and published drawings for products and applications indicated.
- B. Install forming/damming/backing materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.
- C. Install fill materials for firestop systems by proven techniques to produce the following results:
1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
 2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
 3. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.04 FIRE RESISTIVE JOINT SYSTEM INSTALLATION

- A. Perimeter Fire Containment Systems:
1. Where indicated for gaps between tops of fire resistance rated partitions assemblies and fire resistance rated ceilings, floor slabs, and roofs, provide a perimeter fire containment system with the fire test response rating of the assembly indicated, as determined by UL 2079. Materials shall be identified with UL classification markings.

3.05 PUTTY PAD INSTALLATION

- A. Compliance: Comply with manufacturer's product data, including product technical bulletins, product catalog installation instructions and product carton instructions for installation.
- B. Installation:
 - 1. Remove the release paper.
 - 2. Inspect the outlet box to make sure it is properly installed and free of free of dust, grease, oil, loose materials, rust or other substances.
 - 3. Starting at side, align the putty pad to front edge of box and overlap onto the stud.
 - 4. Cut the putty pad to allow the pad to fit around conduits or cables.
 - 5. Pleat the extra material at the corners.
 - 6. Fold the pleated corners into place and firmly press the putty pad into place so that the entire surface of the back of the outlet box is covered.

3.06 IDENTIFICATION

- A. Identify through-penetration firestop systems with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6-inches of edge of the firestop systems so that labels will be visible to anyone seeking to remove penetrating items or firestop systems. Use mechanical fasteners for metal labels. For plastic labels, use self-adhering type with adhesives capable of permanently bonding labels to surfaces on which labels are placed and, in combination with label material, will result in partial destruction of label if removal is attempted. Include the following information on labels:
 - 1. The words "Warning - Through-Penetration Firestop System - Do Not Disturb. Notify Building Management of Any Damage."
 - 2. Contractor's name, address, and phone number.
 - 3. Through-penetration firestop system designation of applicable testing and inspecting agency.
 - 4. Date of installation.
 - 5. Through-penetration firestop system manufacturer's name.
 - 6. Installer's name.

3.07 FIELD QUALITY CONTROL

- A. Inspecting Agency: Owner will engage a qualified testing agency to perform tests and inspections according to ASTM E2174 and to prepare test reports. Inspecting Agency will state in each report whether inspected through-penetration firestop systems comply with or deviate from requirements.
- B. Where deficiencies are found, repair or replace through-penetration firestop systems so they comply with requirements.

February 27, 2026

- C. Proceed with enclosing through-penetration firestop systems with other construction only after inspection reports are issued and firestop installations comply with requirements.

3.08 CLEANING AND PROTECTING

- A. Clean off excess fill materials adjacent to openings as Work progresses by methods and with cleaning materials that are approved in writing by through-penetration firestop system manufacturers and that do not damage materials in which openings occur.
- B. Provide final protection and maintain conditions during and after installation that ensure that through-penetration firestop systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated through-penetration firestop systems immediately and install new materials to produce systems complying with specified requirements.

END OF SECTION

SECTION 07410 – STANDING SEAM METAL ROOF PANELS

PART 1 - GENERAL

1.01 SUMMARY

- A. Work Includes: Extent of standing seam metal roof is indicated on the drawings and by provisions of this section. Provide all materials including all flashings for a complete system.
- B. Type of panels required include the following: Formed sheet panels, intended for concealed fastener installation which are structurally capable of withstanding the wind loads and uplift pressures of the Project.
- C. Related Work Described Elsewhere:
 - 1. Section 05120 – STRUCTURAL STEEL FRAMING
 - 2. Section 06100 – ROUGH CARPENTRY
 - 3. Section 07210 – BUILDING INSULATION
 - 4. Section 07600 – FLASHING AND SHEET METAL
 - 5. Division 15: MECHANICAL: Mechanical work penetrating thru roof.
 - 6. Division 16: ELECTRICAL: Electrical work penetrating thru roof.

1.02 PERFORMANCE REQUIREMENTS

- A. Except as otherwise indicated, Standing Seam Metal Roofing System is required to establish and maintain a waterproof continuous seal on a permanent basis, with recognized limitations of wear and aging as indicated for each application. Failures of installed roofing materials to comply with this requirement will be recognized as failures of materials and workmanship.
- B. As roofing manufacturer's system installation requirements and tested assemblies vary, this specification is to provide and intent of the type of membrane and overall roofing system. The noted performance requirements shall be met by the installed system. The installer shall provide the manufacturer of their choice with all applicable project documents for review before the installer shall develop and submit final costs. Whether specifically noted by the project documents or not, the installer shall include all manufacturer requirements and recommendations (and including all project document related requirements when more stringent) in the final submitted costs.
- C. Material Compatibility: Provide roofing materials compatible with one another under conditions of service and application required, as demonstrated by roofing membrane manufacturer based on testing and field experience
- D. Wind-Uplift Resistance: Provide standing seam metal roofing capable of resisting the following project windloads. Provide clips, fasteners, and clip spacings of type indicated and with capability to sustain, without failure, a load equal to 2 times the wind uplift resistance. Wind uplift resistance shall be determined in accordance with IBC 2018 as amended and ASCE 7 "Minimum Design Loads for Buildings" but not less than required by UL 580 wind uplift rating of UL 90.
 - 1. Project Wind Speed: 168 mph in 3-second gusts, Exposure C.

February 27, 2026

2. Topographic Factor: 1.0
 3. Directionality Factor: 0.85.
- E. Structural capacity of metal roofing system shall be determined in accordance with ASTM E 1592. A minimum of two tested spans are required in order to interpolate allowable load data between tested spans. Extrapolation of data outside the tested spans is not allowed.
- F. Provide a design analysis signed by a registered Professional Engineer licensed in the State of Hawaii, confirming that the structural capacity of the metal roofing system as determined in accordance with ASTM E 1592 is adequate to resist the design loads required by the International Building Code. Analysis shall include calculation verifying the design loads, the uplift pressures, and how those loads affect the various areas of discontinuity clearly shown and distinguished from the typical field roof elements.
- G. Resistance to Water Infiltration: Roofing system shall show no infiltration at seams, edges, flashings, counter-flashings and penetrations at a static pressure of 12.0 lbf/sq. ft when tested per ASTM E 1646.
- H. Air Infiltration: Maximum 0.007 cfm/sq. ft. (0.3 L/s per sq. m) per ASTM E 1680 at a static-air-pressure difference of 6.24 lbf/sq. ft.
- I. Thermal Movement: Allow for thermal movements from ambient and surface temperature changes. Temperature Change (Range) of 120 deg F, ambient; 200 deg F, material surfaces.
- 1.03 QUALITY CONTROL
- A. Installer Qualifications: Engage a single firm to assume undivided responsibility for installing all components of the Roofing System including all related sheet metal flashings and all other components. The installer shall be authorized or licensed by the panel manufacturer to install manufacturer's products and that is eligible to receive manufacturer's warranty. The actual work shall be supervised by personnel trained by the manufacturer in proper application of the product. The installer shall have capability for preparation of shop details and fabrication of all flashings not furnished by the panel manufacturer. Installer must execute 100% of metal roof system installation with installer's own forces. Panels shall be factory-produced only. No portable, installer-owned or installer rented machines will be permitted.
1. Installer shall provide evidence of at least three (3) similar and successful installations including contact names and numbers regarding those projects.
- B. Installation Crew: Provide and maintain same foreman and crew from start to finish of work unless change is approved by the Architect and manufacturer's representative. Workmen who will be walking on roof panels shall wear soft-soled shoes that will not damage the panels.
- C. A project specific QA / QC manual shall be submitted by the Installer before any work has begun. This manual shall be reviewed at the pre-installation meeting and copies shall be kept at roof level in the possession of the Installer's supervisory personnel. Approved shop drawings and all other pertinent submittal materials shall be kept at roof level in the possession of the Installer's supervisory personnel.

February 27, 2026

- D. Flashing and Sheet Metal Accessories shall comply with SMACNA's "Architectural Sheet Metal Manual." Conform to dimensions and profiles shown unless more stringent requirements are indicated.
- E. Take required steps and precautions to properly isolate and prevent of incompatibility between this system and adjacent work, in accordance with manufacturer's specifications, recommendations and instructions.
- F. Manufacturer Qualifications: Roofing membrane and all accessory products shall be provided by a single manufacturer with a minimum of 15 years' experience in the direct production and sales of roofing systems. Manufacturer shall be capable of providing field service representation during construction and recommending appropriate installation methods.
- G. Source Limitations: Obtain components for roofing system from a single manufacturer.
- H. Manufacturer's Technical Representative: The representative shall have authorization from manufacturer to approve field changes and shall be thoroughly familiar with the products and with installations in the geographical area where construction will take place. The manufacturer's representative shall be an employee of the manufacturer with at least 5 years' experience in installing the roof system.
- I. Manufacturer's technical representative shall make periodic site visits and complete inspection reports that are submitted to the owner. At least one visit per roof area not including final inspections. Final inspections by the roofing membrane manufacturer shall be coordinated at least two weeks in advance with the Contractor and Owner/Owners consultants so that their attendance can be properly coordinated. Final inspection reports and signed / completed punch list reports by the roofing membrane manufacturer shall be submitted to the owner. Submittal of the roofing warranty alone shall not be acceptable.
- J. Pre-roofing Conference: After submittals are received and accepted but before roofing work, including associated work are performed, the Contractor shall hold a prerooting conference to review the following:
 - 1. Procedure for on site inspection and acceptance of the roofing substrate and pertinent structural details relating to the roofing system.
 - 2. Contractor's plan for coordination of the work of the various trades involved in providing the roofing system and other components secured to the roofing.
 - 3. Attendees: The pre-roofing conference shall be attended by the Contractor and personnel directly responsible for the roofing installation and the roofing manufacturer's technical representative. Conflicts among those attending the prerooting conference shall be resolved and confirmed in writing before roofing work, including associated work, is begun. Prepare written minutes of the pre-roofing conference and submit to the Architect.
- K. Mock-up:
 - 1. Construct mockup(s) of metal roofing system, from eave to ridge, 10-12 feet wide, including associated attachments, flashings, joints and junctions, ridge, hip and valley construction, control or expansion joints, terminations and terminating components, for Architects review and acceptance. Demonstrate proposed junctions of roofing system with various roof elements and related accessories indicated on the Drawings. At Architects request, provide

additional mockups until satisfactory installation and appearance are obtained.

2. Locate mockup where directed by the Architect. Make such modifications and revisions to installation as the Architect may request, until the Architects acceptance is obtained. Match accepted mockup in subsequent installations. At the Architects request, remove non-matching work and replace with work matching accepted installation.
3. Mockup may remain as part of the work, at the discretion of the Architect.

1.04 SUBMITTALS

A. Submit in accordance with Section 01330- SUBMITTAL PROCEDURES.

1. Product Data: Submit manufacturer's product specifications, standard details, installation instructions and general recommendations, as applicable to materials and finishes for each component and for total system of preformed panels.
2. Shop Drawings: Submit shop drawings of all roofing, flashing, fastenings, supports, anchors, and clearances, and connection details to the Contracting Officer for acceptance.
 - a. Plans shall clearly show all adjacent materials for proper coordination including but not limited to plans, elevations, sections, details and attachments to other work. Do not use or submit drawings prepared by Architect or Owner for shop drawings.
 - b. Calculations that are wet stamped by a duly licensed professional engineer. Calculations shall include all relative metal panel information. Calculations confirming project specific wind uplift conditions and associated attachment methods and materials, as required to comply with 1.02 of this section, shall also be noted on the shop drawings and / or submitted separately. Calculations submitted separately must be submitted at the same time as the shop drawings.
 - c. Associated sheet metal flashing systems shall be included in shop drawings and clearly detailed in coordination with adjacent exterior finish materials. Sheet metal items shall be clearly noted regarding gauge, profile, fastening and compliance with applicable anticipated project specific wind uplift forces.
3. Samples: Furnish 12-inch long samples of full width panel materials and samples of all other materials to be used to Architects for approval.
4. Test Reports: Provide test data demonstrating structural capacity, wind uplift and resistance to water infiltration performance as specified.
5. Manufacturer's Technical Representative's Reports: Submit copies of all reports to the Architect.
6. Warranty: Submit warranty as noted under paragraph entitled "WARRANTY".

1.05 DELIVERY, STORAGE, AND HANDLING

- ##### A. Deliver, store, and handle preformed panels, bulk roofing products and other manufactured items in a manner to prevent damage or deformation.

February 27, 2026

- B. Delivery: Provide adequate packaging to protect materials during shipment. Do not uncrate materials until ready for use except for inspection. Immediately upon arrival of materials at jobsite, inspect materials for damage, dampness, and staining. Replace damaged or permanently stained materials that cannot be restored to like-new condition with new material. If materials are wet, remove moisture, restack and protect panels until used.
- C. Provide strippable coating on top side of pre-finished panels to protect the finish during fabrication, shipping, and handling. Film shall be removed prior to installation
- D. Storage: Stack materials stored on the site on platforms or pallets and cover with tarpaulins or other suitable weathertight coverings which prevent water trapping or condensation. Store panels so that water which might have accumulated during transit or storage will drain off. Do not store the panels in contact with materials that might cause staining, such as mud, lime, cement, fresh concrete or chemicals. Protect stored panels from wind damage.
- E. Handling: Handle material carefully to avoid damage to surfaces, edges and ends.

1.06 WARRANTY

- A. Special Warranty: Manufacturers standard form, without monetary limitation, in which manufacturer agrees to repair or replace components of metal roof system that fail in materials or workmanship within specified warranty period. Failure shall include roof leaks.
 - 1. Special Warranty shall include roof panels, base flashings, roof system accessories, roof insulation, fasteners, cover board and other components of roofing system.
 - 2. Warranty Period: 10 years from date of Substantial Completion.
 - 3. Wind Speed: At a minimum Project Wind Speed as indicated in Article 1.02 of this Section and in concert with Factory Mutual wind speed determination, whichever is more stringent. Note: All manufacturer material and installation requirements to obtain wind speed warranty shall be included by the installer.
- B. Provide manufacturer's warranty for coating system under Hawaiian weather conditions, provide following as a guide for expected warranty:
 - 1. The roofing panels and matching flashings with a factory applied Fluoropolymer paint finish are free from material defects and shall be warranted for 20 years from the date of Substantial Completion against peeling, chipping, cracking or color change in excess of 5 NBS units during the term of this warranty. In the event that the above paint system fails under normal wind and weathering conditions within the warranty period, the manufacturer/supplier shall replace or repair as necessary any panels whose factory color finish that fails. This paint finish warranty commences upon Substantial Completion.
- C. The Surety and the Contractor shall not be held liable beyond two years from the Substantial Completion date.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design Product: The product indicated in this Section and on the drawings, is Snap-Clad Panel as manufactured by Petersen Aluminum Corporation.
- B. Subject to compliance with requirements and Architects approval comparable products from the following manufacturers may be substituted:
 - 1. Custom-Bilt Metals; CB-150
 - 2. Firestone Building Products; UC-3
 - 3. Kloeckner Metals; MAC 150
 - 4. or approved equal.

2.02 MATERIALS

- A. Roof Panels: Formed from minimum 0.040-inch prefinished aluminum of alloy 3003-H14 or 5052-H32 conforming to ASTM B 209.
 - 1. Surface: Smooth
- B. Panel configuration shall be standing seam roofing with concealed fasteners. Pan width shall be 18-inches with a 1-3/4" inch vertical leg with flat pan. Panels shall be designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels, engaging opposite edge of adjacent panels, and snapping panels together, sealed with factory-applied sealant. Provide panel with roof panel manufacturer's factory-installed, in-seam, thermally applied, seam sealant.
- C. Anchor Clips: Stainless steel, 2-piece, 18-gauge base and 22-gauge top, with movement allowance of 3-inch. Clip shall have a self-centering feature to assure movement capability in both directions.

2.03 FLASHING AND CLOSURES

- A. Flashing and Trim: Flashing shall be formed from the same material type and finish as the roof panel. Minimum thickness shall be the same as the roof panel unless otherwise indicated.
- B. General:
 - 1. Configuration of flashings shown on the drawings are intended to indicate basic intent. Other flashings which accomplish the basic intent will be acceptable if standard with the panel manufacturer.
 - 2. Provide metal flashings for locations indicated. Furnish sheet metal flashing items in 8- to 10-foot lengths. Single pieces less than 8-feet long may be used at corners, and at ends of runs.
 - 3. Provide accessories and other items essential to complete the sheet metal installation of the same materials as the items to which they are applied.
 - 4. Connect all pieces of linear flashing by a slip joint to permit thermal movement.
 - 5. Miter conditions shall be factory welded material to match sheeting.

- C. Gutters: Formed to cross section indicated, from same material as roof panels, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 96-inch- long sections. Furnish flat-stock gutter spacers and gutter brackets fabricated from same metal as gutters of size and metal thickness according to SMACNA's "Architectural Sheet Metal Manual." but not less than twice the gutter thickness. Space gutter supports a maximum of 36 inches o.c. Fabricate expansion joints, expansion-joint covers and gutter accessories from same metal as gutters. Provide wire ball strainers of compatible metal at outlets.
 - 1. Gutter Profile: As indicated
 - 2. Sheet Metal Thickness: 0.040-inch
 - 3. Fabricate and locate lap type expansion joints in compliance with SMACNA recommendations for the material specified. Expansion joint to be type as shown in Figure 1-6 in the SMACNA "Architectural Sheet Metal Manual".
- D. Downspouts: Fabricate round downspouts from same material as roof panels, to the size indicated on the Drawings, complete with mitered elbows. Furnish with metal hangers, from same material as downspouts, and anchors.
 - 1. Hanger Style: SMACNA figure designation 1-35D
 - 2. Sheet Metal Thickness: 0.032-inch.
- E. Base, Counter, Drip Edge, Valley, Eave, Rake, Ridge and Hip Flashings: to be fabricated in same material and thickness as roof panels.

2.04 METAL FINISH

- A. General: Apply coatings either before or after forming and fabricating panels, as required by coating process and as required for maximum coating performance capability.
- B. For exposed to exterior surfaces, provide Kynar 500 coating with a top side film thickness of 0.70 to 0.90 mil over a 0.25 to 0.3 mil prime coat to provide a total dry film thickness of 0.95 to 1.25 mil, to meet AAMA 621. Bottom side shall be coated with a primer with a dry film thickness of 0.25 mil. Finish shall conform to all tests for adhesions, flexibility and longevity as specified by Kynar finish supplier.
 - 1. Color: To be selected by Architect.
 - 2. Concealed Finish (Interior Surface): Pretreat with manufacturer's standard white or light-colored acrylic or polyester-backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

2.05 MISCELLANEOUS MATERIALS

- A. Fasteners: Fasteners shall be stainless steel with composite metal and neoprene composition washers. Where required, exposed fasteners shall be gasketed on the exterior side of the covering to waterproof the covering and finished to match roof finish. Concealed fastener and clip system shall be manufacturer approved for system provided and uplift specified.
- B. Accessories: Except as indicated as work of another specification section, provide components required for a complete roofing system, including stainless steel clips, standoff clips, sidelap clips, and uplift clips; trim, flashings and

- expansion joint flashing; single component polyurethane sealants, gaskets, fillers, closure strips and similar items. All clips shall be stainless steel. Match materials/finish of preformed roof panels where exposed.
- C. Closure Strips: Formed specifically for this purpose of laminated cross-linked polyethylene closed cell-foam or neoprene materials and as standard with manufacturer. Molded closure strips shall be free of open voids and shall not absorb or retain water. Closure strips shall be formed to match configurations of the roofing and shall be provided where indicated and where necessary to provide weathertight construction.
 - D. Exposed Sealant: ASTM C 920; silicone sealant; of type, grade, class, and use classifications required to seal joints in metal roof panels and remain weathertight; as recommended by metal roof panel manufacturer colored to match panel color.
 - E. Sealing Tape: For side laps, end laps and flashing details, pressure-sensitive, 100 percent solids, polyisobutylene compound sealing tape with release-paper backing. Provide permanently elastic, non-sag, nontoxic, non-staining tape.
 - F. Butyl Sealant: For side laps, end laps and flashing details, ASTM C 1311, single-component, solvent-release butyl rubber sealant, polyisobutylene plasticized, heavy bodied for hooked-type expansion joints with limited movement.
 - G. Mastic: As recommended by the roofing manufacturer.
 - H. Bituminous Coating: Cold-applied asphalt mastic, SSPC paint 12, compounded for 1 5-mil dry film thickness per coat.
 - I. Prefabricated Pipe Flashing System: A premolded flexible pipe sleeve of EPDM in pleated concentric rings, and bond to a square, corrosion-resistant base of soft, aluminum alloy, allowing conformance of base by hand pressure to roofing panel profile. Pipe flashing system shall be equal to "Master Flash" by Aztec Washer, "Dektite" by Buildex, or approved equal.
 - J. Waterproofing Underlayment: Self-Adhering, High-Temperature Sheet, 40 mils thick minimum, consisting of slip-resisting, polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacture.
 - 1. Carlisle WIP 300 HT High Temperature Protection Self Adhering Roofing Underlayment.
 - 2. Clad-Gard SA-S; Firestone Building Products
 - 3. Palisade SA-HT; SDP Advanced Polymer Products Inc.
 - 4. Sharkskin Ultra SA; Kirsch Building Products, LLC
 - 5. Wind and Water Seal High Temperature; MFM Building Products Corp.
 - K. Flexible Flashing: Aluminum foil faced 45 mil rubberized asphalt or butyl rubber roll sheet as recommended by roofing manufacturer for waterproofing top set flashings.

2.06 PANEL FABRICATION

- A. General: Fabricate and finish panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes, and as

- required to fulfill performance requirements, which have been demonstrated by factory testing. Comply with indicated profiles and dimensional requirements, and with structural requirements. Fabricate panels in full lengths from ridge to eave to the greatest extent possible.
- B. Metal Gages: Thicknesses required for structural performances, but not less than manufacturer's recommended minimums for profiles and applications indicated, and not less than specified under "Roof Panels".
 - C. Metal Protection: Where dissimilar metals will contact each other, protect against galvanic action by painting contact surfaces with bituminous coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by manufacturers of dissimilar metals or by fabricator.
 - D. Sheet Metal Accessories: Custom fabricate flashings and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated. Obtain field measurements for accurate fit before shop fabrication.
 - 1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
 - 2. Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
 - 3. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
 - E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
 - 1. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" for application but not less than thickness of metal being secured.

PART 3 - EXECUTION

3.01 GENERAL

- A. Install roofing, insulation, flashings, and accessories in accordance with roofing manufacturer's published instructions and recommendations for the specified roofing system. Where manufacturer provides no instructions or recommendations, follow good roofing practices and industry standards. Comply with federal, state, and local regulations.
- B. Obtain all relevant instructions and maintain copies at project site for duration of installation period.
- C. Verify that shop drawings prepared by metal roof panel manufacturer have been approved and are available to installers; do not use drawings prepared by Architect or owner for installation drawings.
- D. Verify that the specifications and drawing details are workable and not in conflict with the roofing manufacturer's recommendations and instructions; start of work constitutes acceptance of project conditions and requirements.
- E. Does not start work until Pre-Installation Notice has been submitted to manufacturer as notification that this project requires a manufacturer's warranty.

- F. Perform work using competent and properly equipped personnel.
- G. Temporary closures, which ensure that moisture does not damage any completed section of the new roofing system, are the responsibility of the applicator. Completion of flashings, terminations, and temporary closures shall be completed as required to provide a watertight condition.
- H. Install roofing only when surfaces are clean, dry, smooth and free of snow or ice; do not apply roofing during inclement weather or when ambient conditions will not allow proper application; consult manufacturer for recommended procedures during cold weather. Do not work with sealants and adhesives when material temperature is outside the range of 60 to 80 degrees F (15 to 25 degrees C).
- I. Protect adjacent construction, property, vehicles, and persons from damage related to roofing work; repair or restore damage caused by roofing work.
 - 1. Protect from spills and overspray from bitumen, adhesives, sealants and coatings.
 - 2. Particularly protect metal, glass, plastic, and painted surfaces from bitumen, adhesives, and sealants within the range of wind-borne overspray.
 - 3. Protect finished areas of the roofing system from roofing related work traffic and traffic by other trades.
- J. Until ready for use, keep materials in their original containers as labeled by the manufacturer.
- K. Consult roofing manufacturer's instructions, container labels, and Material Safety Data Sheets (MSDS) for specific safety instructions. Keep all adhesives, sealants, primers and cleaning materials away from all sources of ignition.

3.02 EXAMINATION

- A. Examine roof deck to determine that it is sufficiently rigid to support installers and their mechanical equipment and that deflection will not strain or rupture roof components or deform deck.
- B. Verify that surfaces and site conditions are ready to receive work. Correct defects in the substrate before commencing with roofing work.
- C. Verify that the substructure installation is in accordance with the approved shop drawings and roof panel manufacturer's requirements that the fasteners are correct for the substrate, and the substrate is installed to accommodate and support the appropriate clip spacing and attachment.
- D. Verify that installed work of other trades that such work is complete to a point where the roofing system installation may commence.
- E. Verify that roof openings, curbs, pipes, sleeves, ducts, vents, and other penetrations through roof substrate are complete and properly located.
- F. In event of discrepancy, notify General Contract and the Contracting Officer in writing; do not proceed with installation until discrepancies have been resolved. The Manufacturer's Technical Representative shall approve roof substrate as suitable for roofing system application.

3.03 INSTALLATION, GENERAL

- A. Comply with panel fabricator's and material manufacturers' instructions and recommendations for installation, as applicable to project conditions and supporting substrates.
- B. Anchor panels and other components of the work securely in place in full and firm contact with concealed anchor clips with provisions for thermal/structural movement of the panels.
- C. Obtain acceptance prior to installation on prefinished panels cut in the field and factory applied coverings or coatings that were repaired after being abraded or damaged during handling or installation. Make repairs with material of same color as weather coating. Completely seal openings through panels.
- D. Correct defects or errors in materials in an approved manner. Replace materials which cannot be corrected in an approved manner with new materials. Provide molded closure strips where indicated and where necessary for weathertight construction.

3.04 WATERPROOFING UNDERLAYMENT INSTALLATION

- A. Install underlayment over entire area to be roofed in accordance with manufacturer's instructions.
- B. Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation.
- C. Apply wrinkle free, in shingle fashion to shed water, and with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps with roller.
- D. Install waterproofing underlayment to provide for a continuous and uninterrupted waterproofing membrane under the metal roofing system. Tie-in to adjacent cladding systems to provide for waterproofing continuity.

3.05 INSTALLATION

- A. Install the metal roof panel system in accordance with the manufacturer's instructions, installation drawings, and approved shop drawings, so that it is weathertight and allows for thermal movement.
- B. Install metal roof panels with standing seams parallel to slope of roof. Attach clips to bearing plates with a minimum of 3 stainless steel screws per clip unless manufacturer's data allows otherwise for the required performance specified.
- C. Attach panels to structure with concealed clips which are incorporated into the panel seams. Clip attachment shall allow roof to move freely and independently of the structure. With clip screws in place, test all clips for freedom of movement before covering with the next panel. All clips that bind and cannot be moved with hand pressure shall be replaced.
- D. Seamed Joint: Crimp standing seams with manufacturer-approved, motorized seamer tool so clip, metal roof panel, and factory-applied sealant are completely engaged.
 - 1. Joint Type: Continuous Interlock
- E. Before applying roofing over flashing such as at eaves, valleys and penetrations, place additional sealant on the underside of the pan to assure a continuous seal.

February 27, 2026

- F. Installation Tolerances: Shim and align panel units within installed tolerance of 1/4-inch in 20'-0" on level/plumb/slope and location line as indicated, and within
- G. 1/8-inch offset of adjoining faces and of alignment of matching profiles. Layout lines parallel to the rakes at intervals. Use a spacing gage at each row of panels to ensure that panel width is not stretched or shortened.
- H. All field cutting of roofing panels shall be done mechanically, no saw or abrasive cutting will be allowed.
- I. Joint Sealers: Install joint fillers and sealants where indicated and where required for weatherproof performance of panel system. Provide types of sealants/fillers indicated or, if not otherwise indicated, types recommended by panel manufacturer. Refer to Section 07910 – EXTERIOR WALL JOINT SEALANTS of these specifications for installation requirements applicable to indicated joint sealers.
- J. Flashings: Provide flashing and related closures and accessories in connection with preformed metal panels as indicated and as necessary to provide a weathertight installation. Install flashing to ensure positive water drainage away from roof penetrations. Flash and seal roof at ridge, valleys, eaves and rakes, at projections through roof, and elsewhere as necessary. Accomplish placement of closure strips, flashing, and sealing material in an approved manner that will ensure complete weathertightness. Details of installation which are not indicated shall be in accordance with the NRCA CD, SMACNA ASMM, panel manufacturer's printed instructions and details of the accepted shop drawings. Installation shall allow for expansion and contraction of flashing.
- K. Flashing Fasteners: Fastener spacings shall be in accordance with the panel manufacturer's recommendations and as necessary to withstand the indicated design loads. Install exposed fasteners in panel valleys as recommended by the manufacturer of the panels. Install fasteners in straight lines within a tolerance of 1/2-inch in the length of a bay. Drive exposed penetrating type fasteners normal to the surface and to a uniform depth to seat gasketed washers properly and drive so as not to damage factory applied coating. Exercise extreme care in drilling pilot holes for fastenings to keep drills perpendicular and centered. Do not drill through sealant tapes. After drilling, remove metal filings and burrs from holes prior to installing fasteners and washers. Torque used in applying fasteners shall not exceed that recommended by the manufacturer. Remove panels deformed or otherwise damaged by over-torqued fastenings and provide new panels.
- L. Closure, Closure Strips: Install closure strips as indicated and as recommended by the manufacturer.
- M. Apply bituminous coating or other permanent separation materials on concealed panel surfaces where panels would otherwise be in direct contact with wood or other substrate materials which are noncompatible (i.e. copper and aluminum) or could result in corrosion or deterioration of either material or finishes.

3.06 GUTTER AND DOWNSPOUT INSTALLATION

- A. General: Install sheet metal roof drainage items to produce complete roof drainage system according to SMACNA recommendations and as indicated. Coordinate installation of roof perimeter flashing with installation of roof drainage system.

February 27, 2026

- B. Hanging Gutters: Join sections with lapped joints sealed with elastomeric sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchored gutter straps spaced not more than 36 inches apart. Provide end closures and seal watertight with sealant.
 - 1. Attached gutter to fascia as detailed with expansion joints at locations as indicated and if not indicated then comply with SMACNA recommendations for spacing and location.
- C. Downspouts: Join sections with 1-1/2-inch telescoping joints. Provide fasteners and hangers designed to hold downspouts securely 1 inch away from walls; locate hangers at top and bottom.
 - 1. Provide elbows at base of downspout to direct water away from building.

3.07 CLEAN UP AND PROTECTION

- A. Damaged Units: Replace panels and other components of the work which have been damaged or have deteriorated beyond successful repair by means of finish touch-up or similar minor repair procedures. Touch-up paint shall not be used without the permission of the Architect.
- B. Cleaning: Upon completion of panel installation, clean finished surfaces as recommended by panel manufacturer, and maintain in a clean condition during construction. Remove metal shavings, filings, nails, bolts, and wires from roofs and gutters on completion to prevent discoloration and harm to the panels and flashing. Remove grease and oil films, excess sealants, handling marks, contamination from steel wool, fittings and drilling debris and scrub the work clean. Exposed metal surfaces shall be free of dents, creases, waves, scratch marks, and solder or weld marks.

3.08 MANUFACTURER'S FIELD INSPECTION

Manufacturer's technical representative shall visit the site as necessary during the installation process to assure panels, flashings, and other components are being installed in a satisfactory manner. Manufacturer's technical representative shall perform a field inspection of the installation at Substantial Completion and prior to issuance of warranty. After each site visit, a report, signed by the manufacturer's technical representative, shall be submitted to the Architect noting the overall quality of work, deficiencies and any other concerns, and recommended corrective actions in detail. Notify the Architect a minimum of 2 working days prior to site visit by manufacturer's technical representative.

END OF SECTION

SECTION 07421 – DECORATIVE EXTRUDED ALUMINUM BATTEN WALL PANELS

PART 1 - GENERAL

1.01 SUMMARY

- A. This section includes panelized extruded aluminum battens for walls with supporting extrusion, clips, and all accessories for complete installation.
- B. Related Work:
 - 1. Section 03300 – CAST IN PLACE CONCRETE
 - 2. Section 07241 – DIRECT-APPLIED EXTERIOR FINISH SYSTEM (DEFS)
 - 3. Section 07600 – FLASHING AND SHEET METAL
 - 4. Section 07910 – EXTERIOR WALL JOINT SEALANTS

1.02 REFERENCES

- A. The work of this section shall comply with the latest edition of the following standards. When conflicts arise between standards, the more stringent applies.
 - 1. AAMA – Architectural Aluminum Manufacturers Association
 - a. AAMA 609 & 610 Cleaning and Maintenance Guide for Architecturally Finished Aluminum.
 - b. AAMA CW-10 Care and Handling of Architectural Aluminum from Shop to Site.
 - 2. American Society for Testing and Materials.
 - a. ASTM 153A/153M, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - b. ASTM A653A/653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - c. ASTM B117, Standard Practice for Operating Salt Spray (Fog) Apparatus.
 - d. ASTM B209/B209M, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - e. ASTM B633, Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel.
 - f. ASTM B695, Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel
 - g. ASTM C754, Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
 - h. ASTM C954, Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness.

February 27, 2026

- i. ASTM D2244, Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates.
- j. ASTM D4214, Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films.
- k. ASTM E84, Test Method for Surface Burning Characteristics of Building Materials.
- l. ASTM E136, Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750 °C
- m. ASTM G87, Standard Practice for Conducting Moist SO₂ Tests
- 3. The 2018 International Building Code.
- 4. National Fire Protection Association (NFPA):
 - a. NFPA 285: Standard Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components.

1.03 SYSTEM DESCRIPTION

- A. Extruded aluminum batten system consists of the following:
 - 1. Extruded aluminum battens coated with high performance PVDF powder-coat fluorocarbon finish with simulated woodgrain pattern.
 - 2. Galvanized steel brackets.
 - 3. End closure plugs

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum 5 years experience under current organizational structure.
- B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer with a minimum of five years experience, who has completed systems similar in material, design, and extent to that indicated for Project and with record of successful performance.
- C. Mockups: Build mockups to set quality standards for materials and execution.
 - 1. Build mockup of typical batten system as shown on Drawings, including external and internal corners, supports, attachments, and accessories.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- D. Preinstallation Meetings: Conduct at Project site.
 - 1. Attendees: Contractor and its superintendent, batten system installer, representatives of batten manufacturer, and other parties involved in or

affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow. Advise Architect, Owner, Owner's insurer if applicable of scheduled meeting dates.

2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 3. Inspect and discuss condition of substrate and support conditions including alignment, and other preparatory work performed by other trades.
 4. Review methods and procedures related to batten installation, including manufacturer's written instructions.
 5. Review structural load limitations.
 6. Review special details, penetrations, openings, and condition of other construction that affect battens.
 7. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions.
 8. Review preparation, sequence of operations, and other requirements for installing work of this Section.
 9. Review coordination required with other Sections.
 10. Review protection and repair requirements for completed work.
 11. Record significant proceedings and decisions in minutes including agreements and disagreements, and required corrective measures and actions. Distribute meeting minutes to parties in attendance and others affected by proceedings and decisions made.
- E. Source Limitations: Obtain batten system materials from single source from single manufacturer.
1. Obtain secondary and incidental components from same manufacturer as batten system or manufacturer approved by batten system manufacturer.

1.05 PERFORMANCE REQUIREMENTS

- A. Structural Performance Requirements: Provide extruded aluminum batten wall system, including anchorages, capable of withstanding, without failure, the effects of gravity loads and the following loads and stresses within limits and under conditions indicated, determined per the following code requirements:
1. Design Wind Loads:
 - a. Projected Wind Speed: 168mph in 3-second gusts
 - b. Exposure C
 - c. Topographic Factor: 1.0
 - d. Directionality Factor 0.85
 2. Deflection Normal to Wall Plane: For continuous aluminum members, total load deflection shall not exceed $L/180$ of clear span.

February 27, 2026

- B. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Smoke Developed: As indicated on Drawings.
 - 2. Flame Spread: As indicated on Drawings.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
 - 1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

1.06 SUBMITTALS

- A. Submit under the provisions of Section 01330 – SUBMITTAL PROCEDURES.
- B. Submit the following information from the manufacturer:
 - 1. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for batten wall system.
 - 2. Shop Drawings:
 - a. Indicate layout, profiles and product components including dimensions, wall openings, and finish colors and textures.
 - b. Include details showing the various system parts, fastening, accessories, anchoring methods, and location and configuration of movement joints.
 - 3. Sample Manufacturers Standard Warranty.
 - 4. Sample Maintenance Data.
- C. Qualification Data: For installer and manufacturer.
- D. Samples: Submit 5 samples of specified products for each exposed product and for each color and texture specified, 6 in length. Include batten manufacturer's color charts showing full range of standard colors and finishes.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials and components in manufacturers' unopened containers or bundles, fully identified by name, brand, type and grade. Prevent damage during unloading, storing and installation.
- B. Store, protect and handle materials and components in accordance with manufacturer's recommendations to prevent twisting, bending, mechanical damage, contamination and deterioration.
- C. Store materials off ground on clean pallets and keep clean, dry, flat, and free of dirt and other foreign matter.
- D. Do not expose battens with strippable film to direct sunlight or extreme heat.
- E. Handle products of this section in accordance with AAMA CW-10.

February 27, 2026

1.08 JOB CONDITIONS

- A. Ambient Conditions: Proceed with installation only when existing and forecasted weather conditions permit assembly of batten system to be performed according to manufacturers' written instructions and warranty requirements.

1.09 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of batten systems that fail in materials or workmanship within specified warranty period.

- 1. Failures include, but are not limited to, the following:
 - a. Structural failures including rupturing, cracking, puncturing, or excessive deflection.
 - b. Deterioration of metals and other materials beyond normal weathering.

- 2. Warranty Period: 15 years from date of Substantial Completion.

- B. Special Warranty on Batten Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace battens that show evidence of deterioration of factory-applied finishes within specified warranty period.

- 1. Exposed Batten Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal except for slight crazing or cracking as may occur on tightly roll-formed edges or brake bends at time of forming

- 2. Finish Warranty Period: 15 years from date of Substantial Completion.

- C. Special Warranty: Furnish installer's 2 year labor warranty from date of Owner's acceptance of completed work to cover repair of materials found to be defective as a result of installation errors.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

- A. Basis of Design Product: Provide AL13 Batten System as manufactured by AL13 Architectural Systems a subsidiary of Aneda Systems Inc.

2.02 MATERIALS ERIALS

- A. Aluminum Batten Material: ASTM B209, ANSI H35.1 alloy designation 6063 T5 tension leveled, aluminum.
 - 1. Batten Width: 2 inches (50.8 mm).

February 27, 2026

2. Batten Depth: 2 inches (50.8 mm).
 3. Batten Length: As indicated on Drawings
 4. Minimum Batten Thickness: 0.063 inch (1.60 mm).
 5. Profile: Square.
 6. Exterior Finish: Two-coat fluoropolymer with simulated woodgrain pattern.
 - a. Color: As selected by Architect from full range of colors.
- B. End Plugs: Polyethylene finished to match battens

2.03 AUXILIARY MATERIALS

A. Attachment Framing

1. Brackets: ASTM A653, Grade 230 cold-formed, metallic-coated steel sheet, minimum 0.0516 inch (1.27 mm) thick, with ASTM A653/A653M, G90 (Z275 hot-dip galvanized) coating designation, 12 to 12-1/2 inch (304.8 to 317.5 mm) nominal length; powder-coated black.
 - a. Assembled Gap Between Battens: 2 inches (50.8 mm).
2. Girts and Subgirts: ASTM A653, Grade 230 cold-formed, metallic-coated steel sheet, minimum 0.0516 inch (1.27 mm) thick, with ASTM A653/A653M, G90 (Z275 hot-dip galvanized) coating designation, finished to match battens where visible in finished work.
 - a. Subgirts: Adjustable double-angle profile as indicated to accept batten with structural attachment to building frame.

B. Accessories

1. Bracket to Batten Fasteners: Corrosion-resistant-coated, self-drilling screws designed to withstand design loads of size of type as recommended in writing by batten manufacturer. Provide EPDM or PVC sealing washers for exposed fasteners with heads matching color of Battens by means of plastic caps or factory-applied coating.
 - a. Screws for attachment to steel framing: ASTM C954; corrosion resistant, hex-head, self-drilling self-tapping type with EPDM composite washers, minimum No. 10 diameter by length required to penetrate steel and aluminum with not less than three exposed threads, zinc-coated steel as specified below.
 - 1) Acceptable Product: AL13 Hex-Head Fastener, #10-16 x 3/4
2. Fasteners for Brackets to Supporting Substrate: Corrosion-resistant-coated, self-drilling screws designed to withstand design loads of size of type as recommended in writing by batten manufacturer. Provide EPDM or PVC sealing washers for exposed fasteners with heads matching color of Battens by means of plastic caps or factory-applied coating.
 - a. Screws for attachment to steel framing: ASTM C954; corrosion resistant, hex-head, self-drilling self-tapping type, minimum No. 10 diameter by length required to penetrate steel with not less than three exposed threads, zinc-coated steel as specified below.

- 1) Acceptable Product: AL13 Hex-Head Fastener, #10-16 x 3/4.
- b. Screws for attachment to concrete and masonry: Alternating high-low thread form type, hex-head, self-cutting threads with matched tolerance drill bit, minimum No. 11 diameter by length required to penetrate not less than 1-1/4 inch (32 mm) into concrete, stainless steel as specified below.
 - 1) Acceptable Product: AL13 Hex-Head Fastener, 1/4 x 1-1/2 inch.
- c. Material by Location:
 - 1) Screws in contact with concrete and masonry: 300 Series (304, 305, or 316) stainless steel.
 - 2) Other Screws: Zinc-plated carbon steel per ASTM B695 or ASTM B633 with polymer-coating able to withstand salt-spray resistance to red rust of more than 1,700 hours per ASTM B117, 18 cycles of ASTM G87 (DIN 50018) SO2 Kesternich testing with not more than 15 percent red rust or stainless steel.

2.04 FINISHES

- A. High-Performance Organic PVDF Extrusion Finish: 2-coat polyester or polyurethane powder-coated color finish with simulated woodgrain pattern heat-transferred by sublimation process. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating manufacturers' written instructions.
 1. Basis of Design Product: Decoral Process by Decoral System USA Corp.
 2. Color: As selected from manufacturer's full range.
- B. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

2.05 FABRICATION

- A. General: Extrude and finish battens and accessories to indicated profiles at the factory, by manufacturer's standard procedures and processes. Field cut battens to length within dimensional tolerances.
- B. Field Measurements: Verify location of structural members and openings in substrates by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work
- C. Fabrication Tolerances:
 1. Batten bow shall not exceed 1/8 inch in 8 feet (3.175 mm in 2 438 mm).
 2. Batten surfaces shall be free of scratches or marks caused during fabrication or installation.

PART 3 - EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

- A. Comply with manufacturer's printed instructions except where more stringent requirements are shown or specified, and except where manufacturer's technical representative directs otherwise.

3.02 EXAMINATION

- A. Verification of Conditions:
 - 1. Examine substrates, areas, and conditions, with installer present, for compliance with requirements for installation tolerances, operational clearances, and other conditions affecting performance of the Work.
 - 2. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by batten manufacturer.
 - 3. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
 - 4. Examine roughing-in for components and assemblies penetrating battens to verify actual locations of penetrations relative to joint and seam locations of battens.
 - 5. Examine battens before installation. Reject components that are marred, damaged, or deteriorated beyond ability to be touched up as specified below.
 - 6. Proceed with installation only after unsatisfactory conditions have been corrected.

3.03 INSTALLATION

- A. Comply with batten manufacturer's written installation instructions and recommendations and approved submittals.
 - 1. Adjust assembly to secure brackets safely to wall while allowing for expansion and contraction of components.
- B. Do not cut, trim, weld, or braze component parts during installation in manner which would damage finish, decrease strength, or result in visual imperfection or failure in performance. Return component parts which require alteration to shop for further fabrication, if possible, or for replacement with new parts.
- C. Do not span brackets across control and expansion joints.
- D. Erection Tolerances: Comply with the following non-accumulating maximum tolerances:
 - 1. Level: Variation from plane or location shown on shop drawings: 0.4 inches in 33 feet (10 mm in 10 m) length to maximum of 0.79 inches in 328 feet (20 mm over 100 m).

February 27, 2026

2. Plumb: Deviation of vertical and horizontal members: 0.12 inches in 28-feet (3 mm maximum in 8.5 m) run.
3. Alignment:
 - a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch (12.5 mm) wide, limit offset from true alignment to 1/16 inch (1.6 mm).
 - b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch (12.5 to 25 mm) wide, limit offset from true alignment to 1/8 inch (3.2 mm).
 - c. Where surfaces are separated by reveal or protruding element of 1 inch (25 mm) wide or more, limit offset from true alignment to 1/4 inch (6.4 mm).
4. Location: Limit variation from plane to 1/4 inch in 20 feet (6.4 mm in 6 m); 1/2 inch (12.5 mm) over total length.

3.04 REPAIR

- A. Repairing Damaged Finishes: Immediately after installation, repair areas where coatings or finishes are marred, abraded, deteriorated, or otherwise damaged.
 1. Factory-Finished Surfaces: Clean abraded areas and repair with same material used for factory finish per manufacturer's written instructions.
 - a. Use only materials and procedures recommended or furnished by batten manufacturer.
 - b. Touch Up: Repair marred, damaged, or deteriorated surfaces to blend inconspicuously with adjacent unrepaired surface so touchup is not visible from a distance of 48 inches (1219 mm) as viewed by Architect. Apply with an artist brush or by spray to provide a minimum 2.0-mil (0.058 mm) dry film thickness.
 - c. Replace components that cannot be restored to factory-finished appearance or that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures and that cannot be repaired to Architect's and Owner's satisfaction.

3.05 CLEAN UP

- A. Remove protective film from battens within 60 days after installation is complete.
- B. Aluminum Surfaces: Upon completion of installation, thoroughly clean aluminum surfaces in accordance with AAMA 609 & 610.

END OF SECTION

SECTION 07460 – ALUMIUNUM COMPOSITE WALL PANELS

PART 1 - GENERAL

1.01 SUMMARY

- A. Work Includes: Aluminum faced composite panels with mounting system. Panel mounting system including anchorages, shims, furring, fasteners, gaskets and sealants, related flashing adapters, and masking (as required) for a complete installation.
- B. Related Work Described Elsewhere:
 - 1. Section 05400 – COLD-FORMED METAL FRAMING
 - 2. Section 06160 – EXTERIOR GYPSUM SHEATHING
 - 3. Section 07250 – FLUID-APPLIED AIR AND WATER RESISTVE BARRIERS
 - 4. Section 07600 – FLASHING AND SHEET METAL
 - 5. Section 07910 – EXTERIOR WALL JOINT SEALANTS

1.02 CODES AND STANDARDS

- A. The work of this section shall comply with the latest edition of the following standards. When conflicts arise between standards, the more stringent shall apply.
- B. AAMA – Architectural Aluminum Manufacturers Association
 - 1. AAMA 501, Field Testing of Metal Curtain Walls
 - 2. AAMA 503, Voluntary Specification for Field Testing of Storefronts, Curtain Walls and Sloped Glazing Systems.
 - 3. AAMA 508-05: Voluntary Test Method and Specification for Pressure Equalized Rain Screen Wall Cladding Systems.
 - 4. AAMA 2605, Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
 - 5. RPC, Rain Penetration Control
- C. ASTM - American Society for Testing and Materials
 - 1. ASTM B 117, Method of Salt Spray (Fog) Testing
 - 2. ASTM D 822, Practice for Operating Light and Water Exposure Apparatus (Carbon-Arc Type) for Testing Paint, Varnish, Lacquer, and Related Products.
 - 3. ASTM D 1308, Effect of Household Chemicals on Clear and Pigmented Organic Finishes.
 - 4. ASTM D 1781, Climbing Drum Peel Test for Adhesives
 - 5. ASTM D 1929, Standard Test for Ignition Properties of Plastics
 - 6. ASTM D 2244, Calculation of Color Differences from Instrumentally Measured Color Coordinates.

February 27, 2026

7. ASTM D 2247, Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.
8. ASTM D 2794, Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
9. ASTM D 3359, Methods for Measuring Adhesion by Tape Test
10. ASTM D 3363, Method for Film Hardness by Pencil Test
11. ASTM D 4214, Evaluating the Degree of Chalking of Exterior Paint Films
12. ASTM E 84, Surface Burning Characteristics of Building Materials
13. ASTM E 283, Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Difference Across the Specimen.
14. ASTM E 330, Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
15. ASTM E 331, Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

1.03 PERFORMANCE REQUIREMENTS

- A. General Performance: Aluminum Composite Panel System shall comply with performance requirements without failure due to defective manufacture, fabrication, installation, or other defects in construction.
- B. Structural Performance: Aluminum Composite Panel System and its anchorage and related components shall be designed with adequate strength and stiffness to withstand the loads indicated on the Structural Drawings and as determined by the 2018 IBC and ASCE 7 "Minimum Design Loads for Buildings and Other Structures".
 1. Design parameters:
 - a. Exposure: Exposure C
 - b. Ultimate Design Wind Speed: 168 mph
 - c. Importance Factor: 1.5
 2. Deflection Limits: For wind loads, no greater than 1/175 of the perimeter span and L/60 center of panel.
 3. Anchor Deflection: At connection points of framing members to anchors, anchor deflection in any direction not to exceed 1/16-inch.
 4. Design corners for simultaneous positive (inward) design pressures on both surfaces, and simultaneous negative (outward) design pressure on both surfaces.
 5. Partial loading on one surface shall also be considered.
 6. A 1/3 increase in allowable working stress for wind or seismic loads is not acceptable.

February 27, 2026

7. In no case shall the wind load be less than 20 psf for positive and/or negative pressure.
 8. Structural: Provide systems that have been tested in accordance with ASTM E330 at a design loads indicated on the Structural Drawings and have been certified to be without permanent deformation or failures of structural members.
- C. Provision for Movement of Structure
1. When the Aluminum Composite Wall Panel System is attached directly to the building structure, the work shall be designed to accommodate the differential live load deflection between floors in addition to the following:
 - a. Calculated thermal expansion of the system.
 - b. Floor Live Load Vertical Deflection
 - c. Lateral Deflection
 - d. Interstory Drift
 - e. Elastic shortening of the building, as may be anticipated.
 - f. Differential foundation settlement, when relative.
 - g. Exterior Wall Contractor shall obtain all necessary projected data from the Structural Engineer and make such provision in the work as may be necessary. The amount of such movement shall be identified on Exterior Wall Contractor's shop drawings.
- D. Thermal Movement: The work shall be designed to Allow for free horizontal and vertical thermal movement due to expansion and contraction of components over an exterior ambient temperature range of 120°F and metal surface temperature extreme of 180° F.
1. Buckling, opening of joints, undue stress on fasteners, failure of sealants, or any other detrimental effects of thermal movement will not be permitted.
 2. Fabrication, assembly and erection procedures shall take into account the ambient temperature range at the time of the respective operation.
- E. Air Infiltration: For aluminum composite wall panel assembly in conjunction with the air and water resistive barrier specified in Section 07250 – FLUID-APPLIED AIR AND WATER RESISTIVE BARRIERS, air-Infiltration rate shall not exceed 0.06 cfm/ft² for an inward test pressure of 6.24 psf pressure differential when tested in accordance with ASTM E283 and AAMA 101.
- F. Water Penetration:
1. Water penetration or uncontrolled water leakage, in this specification, is defined as Infiltrated water that is not captured, controlled or managed to drain to exterior; water that wets perimeter containment system, wall insulation, or normally exposed interior surfaces. "Controlled" water or condensation is defined as water which is demonstrably drained harmlessly to the exterior of the work without endangering or wetting adjacent surfaces or insulation, and not visible in the final construction.
 2. Provision shall be made to drain to the exterior face of the work, any water entering at joints, and/or any condensation occurring within the work. The

wall shall be designed to collect and remove all water that penetrates through the plaster surface and from the surrounding conditions.

3. Static Water Penetration: Aluminum Composite Panel System in conjunction with the air and water resistive barrier specified in Section 07250 – FLUID-APPLIED AIR AND WATER RESISTIVE BARRIERS, shall have no water penetration as defined by the test method when tested in accordance with ASTM E331 at inward static pressure differential of 12.0 psf.
4. Dynamic Water Penetration: Aluminum Composite Panel System in conjunction with the air and water resistive barrier specified in Section 07250 – FLUID-APPLIED AIR AND WATER RESISTIVE BARRIERS, shall have been tested in accordance with AAMA 501 and shall have passed with no uncontrolled water leakage at 12.0 psf dynamic pressure differential, with water application rate of 5 gallons/hr/sqft.

1.04 QUALITY CONTROL

- A. Fabricator/Installer Qualifications: Engage a single firm with a minimum 10 years' experience of metal panel work similar in scope and size to this project, to assume undivided responsibility for installing all components of the Aluminum Composite Panel System including all related sheet metal flashings and all other components. The installer shall be approved or licensed by the panel manufacturer to install manufacturer's products and that is eligible to receive manufacturer's warranty. The actual work shall be supervised by personnel trained by the manufacturer in proper application of the product. The installer shall have capability for preparation of shop details and fabrication of all flashings not furnished by the panel manufacturer. Installer must execute 100% of Aluminum Composite Panel system installation with installer's own forces.
- B. Flashing and Sheet Metal Accessories shall comply with SMACNA's "Architectural Sheet Metal Manual." Conform to dimensions and profiles shown unless more stringent requirements are indicated.
- C. Take required steps and precautions to properly isolate and prevent of incompatibility between this system and adjacent work, in accordance with manufacturer's specifications, recommendations and instructions.
- D. Manufacturer Qualifications: Composite Panel Manufacturer shall have a minimum of 10 years' experience in the manufacturing of this product and shall be solely responsible for panel manufacture and application of the finish.
- E. Source Limitations: Obtain components for composite panel system from a single manufacturer.
- F. Delegated Engineer Qualifications: Professional Engineer currently licensed in the State of Hawaii experienced in providing engineering service for the type of work specified herein for this Project.
- G. Manufacturer's Technical Representative: The representative shall have authorization from manufacturer to approve field changes and shall be thoroughly familiar with the products and with installations in the geographical area where construction will take place. The manufacturer's representative shall be an employee of the manufacturer with at least 5 years' experience in installing aluminum composite wall panel systems similar in type and scope for this Project.

- H. Manufacturer's technical representative shall make periodic site visits and complete inspection reports that are submitted to the owner. At least one visit per roof area not including final inspections. Final inspections by the roofing membrane manufacturer shall be coordinated at least two weeks in advance with the Contractor and Owner/Owners consultants so that their attendance can be properly coordinated. Final inspection reports and signed / completed punch list reports by the roofing membrane manufacturer shall be submitted to the owner. Submittal of the roofing warranty alone shall not be acceptable.
- I. Preinstallation Conference: Conduct conference at Project site
 - 1. Meet with Architect, metal composite material panel Installer, metal composite panel system manufacturer's representative, structural support installer, and installers whose work interfaces with or affects metal composite material panels, including installers of doors, windows, and louvers.
 - 2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 3. Review methods and procedures related to metal composite material panel installation, including manufacturer's written instructions.
 - 4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
 - 5. Review flashings, special siding details, wall penetrations, openings, and condition of other construction that affect metal composite material panels.
 - 6. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.
 - 7. Review temporary protection requirements for metal composite material panel assembly during and after installation.
 - 8. Review procedures for repair of panels damaged after installation.
 - 9. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.
- J. Mock-up:
 - 1. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
 - 2. Build mockup of typical metal composite material panel assembly as shown on Drawings, including corner, supports, attachments, and accessories.
 - a. Mock-up Size: as indicated by the Architect.
 - 3. Locate mockup where directed by the Architect. Make such modifications and revisions to installation as the Architect may request, until the Architect's acceptance is obtained. Match accepted mockup in subsequent installations. At the Architect's request, remove non-matching work and replace with work matching accepted installation.
 - 4. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

5. Mockup may remain as part of the work, at the discretion of the Architect.

1.05 SUBMITTALS

A. Submit in accordance with Section 01330- SUBMITTAL PROCEDURES.

1. Product Data: Submit manufacturer's product specifications, standard details, installation instructions and general recommendations, as applicable to materials and finishes for each component and for total system of aluminum composite panels.
2. Shop Drawings: Submit shop drawings of all composite panels, flashing, fastenings, supports, anchors, and clearances, and connection details to the Architect for acceptance.
 - a. Plans shall clearly show all adjacent materials for proper coordination including but not limited to plans, elevations, sections, details and attachments to other work. Do not use or submit drawings prepared by Architect for shop drawings.
 - b. Calculations that are wet stamped by a duly licensed professional engineer. Calculations shall include all relative composite panel information. Calculations confirming project specific wind load and seismic conditions and associated attachment methods and materials, as required to comply with 1.03 of this section, shall also be noted on the shop drawings and/or submitted separately. Calculations submitted separately must be submitted at the same time as the shop drawings.
 - c. Associated sheet metal flashing systems shall be included in shop drawings and clearly detailed in coordination with adjacent exterior finish materials. Sheet metal items shall be clearly noted regarding gauge, profile, fastening and compliance with applicable anticipated project specific wind forces.
3. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.
 - a. Metal Composite Material Panels: 12 inches long by actual panel width. Include fasteners, closures, and other metal composite material panel accessories. Custom color sample are not available for this requirement. Standard color samples will be substituted.
4. Test Reports: Provide test data from tests performed by a qualified testing agency demonstrating structural capacity and resistance to water infiltration performance as specified.
5. Fastener and Anchor Test Reports: Certified reports of last completed set of mechanical tests for each device.
6. Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and physical requirements.
7. Manufacturer's Instructions: Manufacturer's installation instructions.
8. Installers Certification: A letter from the manufacturer stating that the installer is certified and approved to install the specified system.
9. Manufacturer's Field Reports: Manufacturer's field reports as called for in the Field Quality Control article in PART 3.

February 27, 2026

10. Warranty: Submit warranty as noted under paragraph entitled "WARRANTY".

11. Maintenance and cleaning instructions.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, metal composite material panels, and other manufactured items so as not to be damaged or deformed. Package metal composite material panels for protection during transportation and handling.
- B. Unload, store, and erect metal composite material panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal composite material panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal composite material panels to ensure dryness, with positive slope for drainage of water. Do not store metal composite material panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Retain strippable protective covering on metal composite material panels during installation.

1.07 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal composite material panels to be performed according to manufacturers' written instructions and warranty requirements.
- B. Field measurements should be taken prior to the completion of shop fabrication whenever possible. However, coordinate fabrication schedule with construction progress as directed by the Contractor to avoid delay of work. Field fabrication may be allowed to ensure proper fit. However, field fabrication shall be kept to an absolute minimum with the majority of the fabrication being done under controlled shop conditions

1.08 COORDINATION

- A. Coordinate metal composite material panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.09 WARRANTY

- A. Manufacturers standard form, in which manufacturer agrees to repair or replace components of aluminum composite panel system that fail in materials or workmanship within specified warranty period of 15 years.
- B. Provide manufacturer's warranty for coating system under Hawaiian weather conditions, provide following as a guide for expected warranty:
 - 1. The aluminum composite panels and matching flashings with a factory applied Fluoropolymer paint finish are free from material defects and shall be warranted for 20 years from the date of Substantial Completion against peeling, chipping, cracking or color change in excess of 5 NBS units during the term of this warranty. In the event that the above paint system fails under

February 27, 2026

normal wind and weathering conditions within the warranty period, the manufacturer/supplier shall replace or repair as necessary any panels whose factory color finish that fails. This paint finish warranty commences upon Substantial Completion.

- C. Contractors Labor Warranties: 2 year labor warranty starting from date of substantial completion to cover repair of materials found to be defective as a result of installation errors.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Metal Composite Material Wall Panel Systems: Provide factory-formed and -assembled, metal composite material wall panels fabricated from two metal facings that are bonded to a polyethylene core; formed into profile for installation method indicated. Include attachment assembly components panel stiffeners, and accessories required for weathertight system.
 - 1. System Type:
 - a. Rout and Return Wet: System must provide a wet seal reveal joint as detailed on drawings. The sealant type shall be as specified in Section 07910 – EXTERIOR WALL JOINT SEALANTS and with foamed type backer rod as indicated on architectural drawings.
- B. Basis of Design Product: The product indicated in this Section and on the drawings, is AL13 Architectural Panels as manufactured by Aneda Systems Inc.
- C. Subject to compliance with requirements and Architect's approval comparable products from the following manufacturers may be substituted:
 - 1. Mitsubishi Plastics Composites America; Apolic/PE
 - 2. NorthClad; ACM Series
 - 3. PAC-CLAD Petersen; PAC-3000 CS
 - 4. or approved equal.

2.02 ALUMINUM

- A. Provide aluminum shapes and thicknesses as shown and as required to fulfill performance requirements. Use suitable alloy and temper for extruding with adequate structural characteristics, and suitable for finishing as specified, but not less than 22,000 psi ultimate tensile strength.
- B. Comply with the following:
 - 1. Sheet and Plate: ASTM B 209, thickness as required by delegated engineering, but not less than 3/16-inch.
 - 2. Extruded Bars, Rods, Shapes, and Tubes: ASTM B 221, thickness as required by delegated engineering, but not less than 1/8 in at any location for main frame and sash members.
 - 3. Profiles: Extruded aluminum C or Z shaped girts, furring channels, angles, channels, tubes, plates, bracing, and other profiles required by delegated engineering.

2.03 ALUMINUM COMPOSITE PANELS

- A. Aluminum-Faced Composite Wall Panels: Formed with 0.020-inch thick, coil-coated aluminum sheet facings, AA A3003-H24 Series Alloy have the following properties:
1. Panel Size: As indicated on Drawings.
 2. Panel Thickness: 4-mm
 3. Panel Weight: 1.17 lbs/sq.ft.
 4. Core: Polyethylene (PE)
 5. Bond Integrity: When tested for bond integrity, in accordance with ASTM D 1781 (simulating resistance to panel delamination), there shall be no adhesive failure of the bond a) between the core and the skin nor b) cohesive failure of the core itself below the following values:
 - a. Peel Strength:
 - 1) 100 N·mm/mm (22.5 in lb/in) as manufactured.
 - 2) 100 N·mm/mm (22.5 in lb/in) after 21 days soaking in water at 70°F (21°C).
 6. Coefficient of Thermal Expansion: ASTM D 696; 1.19×10^{-5} in/in/°F
 7. Tensile Strength: ASTM D 638, 6400 psi
 8. Flexural Strength: ASTM D 790, 14,510 psi
- B. Attachment Assembly Components: Formed from extruded aluminum conforming with ASTM B 209 and the recommendations of the manufacturer.

2.04 MISCELLANEOUS MATERIALS

- A. Miscellaneous Metal Subframing and Furring: 18 gauge thickness galvanized steel to ASTM A653, Grade 230 with Z275 coating. Materials visible after assembly of wall panel shall be finished to match aluminum panels unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal composite material panel system.
- B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal composite material panels unless otherwise indicated.
- C. Flashing and Trim: Provide flashing and trim formed from same material as metal composite material panels, 0.040-inch thick, as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal composite material panels.
- D. Panel Fasteners: Shall be series 300, non-magnetic stainless steel, self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal composite material panels by means of factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.

February 27, 2026

- E. Panel Sealants: ASTM C 920; elastomeric silicone sealant as specified in Section 07910 – EXTERIOR WALL JOINT SELANTS.
- F. Air and Water Resistive Barrier: As specified in Section 07250 – FLUID-APPLIED AIR AND WATER RESISTIVE BARRIERS

2.05 FASTENERS

- A. Any fasteners in wet or exposed areas of the wall shall be series 300, non-magnetic stainless steel. All other fasteners shall be hot-dipped galvanized unless otherwise noted.
- B. The work shall be designed to conceal all fasteners, except where unavoidable for application of hardware. Finish exposed fasteners to match adjacent aluminum.
- C. Unexposed fasteners in dry areas shall be steel with cadmium and colored chromate plated and shall meet ASTM B 696 Class #5 and Federal Specification QQ-P-416E, Type II, Class #1. (.0005 inches thick plating).
- D. All non-stainless fasteners being used in a structural application must meet the minimum requirements of SAE J429 Grade 5.
- E. Grade 8.0 or higher fasteners, high strength bolts of non U.S. origin, or high strength bolts that are zinc plated shall not be used.
- F. Provide aluminum, nonmagnetic stainless steel, epoxy adhesive, or other materials warranted by manufacturer to be noncorrosive and compatible with aluminum window and door members, trim, hardware, anchors, and other components of window units.
- G. Where fasteners screw anchor into aluminum less than 0.125 inch thick, reinforce interior with aluminum or nonmagnetic stainless steel to receive screw threads or provide standard, noncorrosive, pressed-in, splined grommet nuts.
- H. Mill certificates and test reports for all structural grade bolts shall be submitted to the Architect, Owner and their representatives for approval prior to installation of those bolts on the job.
- I. Post-Installed Expansion Anchors: ACI 318, D.1 and ICC-ES AC193
 - 1. Finish: Stainless steel, mechanically deposited ASTM B 695 or hot-dip zinc coating ASTM A153. Thickness not less than 0.002 in (2 mils).
 - 2. Manufacturers and Products (Approved only with ICC Report)
 - a. ITW; Redhead Truebolt Wedge Anchor.
 - b. Powers; Bull Wedge Anchor.
 - c. Simpson; Strong-Bolt Wedge Anchor
- J. Threaded Concrete Anchors: Bi-Metal, 300 Series Stainless Steel head and shank fused to harden steel tapping threads and point with corrosion resistant coating with not less than 800 hours of salt-spray resistance according to ASTM B 117.
 - 1. Basis of Design: Elco Industries, Inc.; Aggre-Gator; Hex Washer Head with Silver Stalgard finish.

February 27, 2026

2. Not Acceptable: Self-drilling self-threading fasteners, screw in plugs, and powder actuated fasteners are not permitted in concrete.
- K. Self-drilling fasteners shall be Drill-Flex as manufactured by Elco Industries, Inc. or Kwik-Flex as manufactured by Hilti, Inc. No substitutions accepted. Self-drilling fasteners used in wet areas shall include Elco's Stal-Guard finish or Hilti's Kwik-Cote finish respectively.
- L. Nuts used at expansion or moving connections shall be designed to provide a positive means of preventing disengagement. Staking of bolts, use of lock washers, or threads being deformed are not acceptable.
- M. Matched bolts, nuts and washers shall be used at all friction connections.

2.06 METAL FINISH

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Manufacturer's standard two-coat, thermo-cured system composed of specially formulated inhibitive primer and Fluoropolymer color topcoat. Color topcoats containing not less than 70% polyvinylidene fluoride resin by weight; comply with AAMA 2605.
 1. Resin Manufacturers: Subject to compliance with requirements, provide products containing resin by one of the following:
 - a. Duranar, PPG
 - b. Fluropon Classic, Valspar Corp.
 - c. Hylar 5000, Ausimont USA, Inc.
 - d. Kynar 5000, Elf Atochem North America, Inc
 2. Color: To be selected by Architect

2.07 PANEL FABRICATION

- A. General: Fabricate and finish metal composite material panels and accessories at the factory, by panel wall system manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.
- B. Panel Tolerances:
 1. Panel Bow: Maximum 0.8% of any 72-inch panel dimension.
 2. Panel Dimensions: Field fabrication shall be allowed where necessary but shall be kept to an absolute minimum. All fabrication shall be done under controlled shop conditions when possible.
 3. Panel lines, breaks, and angles shall be sharp, true, and surfaces free from warp and buckle.
 4. Maximum deviation from panel flatness shall be 1/8 -inch in 5-feet on panel in any direction for assembled units. (Non-accumulative - No Oil Canning).
- C. Metal Protection: Where dissimilar metals will contact each other, protect against galvanic action by painting contact surfaces with bituminous coating, by applying

rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by manufacturers of dissimilar metals or by fabricator.

- D. Sheet Metal Accessories: Custom fabricate flashings and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated. Obtain field measurements for accurate fit before shop fabrication.
 - 1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
 - 2. Fabricate nonmoving seams in accessories with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
 - 3. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
 - 4. Sealed Joints: Form non-expansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
 - 5. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
 - a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" for application but not less than thickness of metal being secured.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal composite material panel supports, and other conditions affecting performance of the Work.
 - 1. Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal composite material wall panel manufacturer.
 - 2. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal composite material wall panel manufacturer.
 - 3. Verify that air and water resistive barriers have been installed over sheathing or backing substrate in accordance with Section 07250 – FLUID-APPLIED AIR AND WATER RESISTIVE BARRIERS, to prevent air infiltration or water penetration.
- B. Examine roughing-in for components and assemblies penetrating metal composite material panels to verify actual locations of penetrations relative to seam locations of metal composite material panels before installation.
- C. Verify that shop drawings prepared by aluminum composite panel manufacturer have been approved and are available to installers; do not use drawings prepared by architect or owner for installation drawings.

February 27, 2026

- D. Verify that the specifications and drawing details are workable and not in conflict with the composite panel manufacturer's recommendations and instructions; start of work constitutes acceptable of project conditions and requirements.
- E. Perform work using competent and properly equipped personnel.
- F. In event of discrepancy, notify General Contractor and the Architect in writing; do not proceed with installation until discrepancies have been resolved.

3.02 PREPARATION

- A. Miscellaneous Supports: Install sub-framing, furring, and other miscellaneous panel support members and anchorages according to ASTM C 754, delegated engineering and metal composite material panel manufacturer's written recommendations.

3.03 INSTALLATION

- A. Installation Quality Standards: In addition to standards listed elsewhere, perform work according to following, unless otherwise specified:
 - 1. Manufacturer's/Fabricators written installation instructions.
 - 2. Approved submittals.
 - 3. Contract Documents
- A. General: Install metal composite material panels according to manufacturer's written instructions in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to supports unless otherwise indicated. Anchor metal composite material panels and other components of the Work securely in place, with provisions for thermal and structural movement.
 - 1. Shim or otherwise plumb substrates receiving metal composite material panels.
 - 2. Flash and seal metal composite material panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until weather-resistive barriers and flashings that will be concealed by metal composite material panels are installed.
 - 3. Install screw fasteners in predrilled holes.
 - 4. Locate and space fastenings in uniform vertical and horizontal alignment.
 - 5. Install flashing and trim as metal composite material panel work proceeds.
 - 6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
 - 7. Align bottoms of metal composite material panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
 - 8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.
- B. Fasteners:
 - 1. Aluminum Panels: Use aluminum or stainless-steel fasteners for surfaces exposed to the exterior; use aluminum or galvanized-steel fasteners for surfaces exposed to the interior.

February 27, 2026

- C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal composite material panel manufacturer.
- D. Attachment Assembly, General: Install attachment assembly required to support metal composite material wall panels and to provide a complete weathertight wall system, including subgirts, perimeter extrusions, tracks, drainage channels, panel clips, and anchor channels.
 - 1. Include attachment to supports, panel-to-panel joinery, panel-to-dissimilar-material joinery, and panel-system joint seals.
- E. Clip Installation: Attach panel clips to supports at locations, spacings, and with fasteners recommended by manufacturer. Attach routed-and-turned flanges of wall panels to panel clips with manufacturer's standard fasteners.
 - 1. Seal horizontal and vertical joints between adjacent panels with sealant backing and sealant. Install sealant backing and sealant according to requirements specified in Section 07910 – EXTERIOR WALL JOINT SEALANTS.
- F. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.
 - 1. Install components required for a complete metal composite material panel assembly including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal composite material panel manufacturer; or, if not indicated, provide types recommended in writing by metal composite material panel manufacturer.
- G. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight.
 - 1. Install exposed flashing and trim that is without buckling and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof performance.
 - 2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints)

3.04 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align metal composite material wall panel units within installed tolerance of 1/8 inch in 15 feet, non-accumulative, on level, plumb, and location lines as indicated, and within 1/16-inch offset of adjoining faces and of alignment of matching profiles.
 - 1. Longitudinal or Diagonal Warp: $\pm 1/8$ -inch in 10-feet straight edge.

HAWAII HEALTH SYSTEMS CORPORATION – KAUAI DIVISION

SMMH Emergency Department Renovation & Addition
Project No. 225057-01

Aluminum Composite Wall Panels
07460-14

3.05 FIELD QUALITY CONTROL

- A. Pre-Testing Conference: Before beginning testing and inspections, conduct conference at Project to comply with requirements of appropriate Division 01 Sections.
- B. Field Testing and Inspections: Engage a qualified independent testing agency to perform field quality control testing and inspections to determine if installed work complies with specified requirements. Aluminum Composite Panel Contractor to provide powered scaffold, hose, water supply, communication system and manpower to perform tests.
- C. Water-Spray Test: After installation, test area of assembly as directed by the Architect for water penetration according to AAMA 501.2
 - 1. Reports: Record testing and inspection results and prepare certified reports according to ASTM E 575 format.
 - 2. Re-testing and Re-inspections Due to Failures: Aluminum Composite Panel Contractor is responsible for expenses incurred, without additional cost to the State, due to failure of work to pass testing and inspections.
- D. Manufacturers Field Inspection: Manufacturers technical representative shall inspect the first day's work and periodically inspect work to ensure installation is proceeding in accordance with manufacturer's designs, recommendations, instructions and warranty requirements. Representative shall submit written reports of each visit indicating observations, findings and conclusions of inspection.

3.06 ADJUSTING

- A. Adjusting:
 - 1. Repair panels with minor damage such that repairs are not discernible at a distance of 10 feet (3 m).
 - 2. Remove and replace panels damaged beyond repair.
 - 3. Remove protective film immediately after installation of joint sealers and immediately prior to completion of composite metal panel work.
 - 4. Remove from project site damaged panels, protective film and other debris attributable to work of this section.

3.07 CLEAN UP AND PROTECTION

- A. Remove temporary protective coverings and strippable films, if any, as metal composite material panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal composite material panel installation, clean finished surfaces as recommended by metal composite material panel manufacturer. Maintain in a clean condition during construction.
- B. After metal composite material panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.
- C. Replace metal composite material panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

February 27, 2026

END OF SECTION

SECTION 07540 – TPO MEMBRANE ROOFING

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes the following:

1. Fully Adhered TPO membrane roofing system at low slope roofs unless otherwise indicated, including base flashing, roofing membrane, membrane expansion joints and all accessories needed for complete installation.
2. Fully Adhered TPO membrane, with fleece back, roofing system at concrete roof decks as indicated on drawings, including base flashing, roofing membrane, membrane expansion joints and all accessories needed for complete installation.
3. Roof substrate board.
4. Roof insulation and cover board.
5. All edge flashing and coping, where TPO membrane roofing is installed under coping or terminated with edge flashing as specified in Section 07600 – FLASHING AND SHEET METAL, shall be provided by the TPO membrane roofing manufacturer, installed by the roofing contractor performing the work specified herein and included in the TPO membrane roofing system warranty.

B. Related Sections include the following:

1. Section 05310 – STEEL DECKING
2. Section 06100 – ROUGH CAPENTRY for wood nailers, curbs, and blocking.
3. Section 07210 – BUILDING INSULATION for above roof deck insulation.
4. Section 07600 – FLASHING AND SHEET METAL for sheet metal roof penetration flashings, flashings, counter-flashings and pre-manufactured coping and edge flashing systems.
5. Section 07910 – EXTERIOR WALL JOINT SEALANTS

1.02 PERFORMANCE REQUIREMENTS

- A. Except as otherwise indicated, Thermoplastic Roof Membrane system is required to establish and maintain a waterproof continuous seal on a permanent basis, with recognized limitations of wear and aging as indicated for each application. Failures of installed roofing materials to comply with this requirement will be recognized as failures of materials and workmanship.
- B. As roofing manufacturer's system installation requirements and tested assemblies vary, this specification is to provide an intent of the type of membrane and overall roofing system. The noted performance requirements shall be met by the installed system. The installer shall provide the manufacturer of their choice with all applicable project documents for review before the installer shall develop

- and submit final costs. Whether specifically noted by the project documents or not, the installer shall include all manufacturer requirements and recommendations (and including all project document related requirements when more stringent) in the final submitted costs.
- C. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing membrane manufacturer based on testing and field experience.
 - D. Provide system to withstand wind loads per the project wind speed and/or as noted on the structural drawings, whichever is more stringent.
 - E. System shall include an air barrier and the air barrier shall be provided by the roofing system manufacturer and shall be part of an overall tested roof assembly.
 - F. Fire-Test-Response Characteristics: Provide membrane roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.
 - 1. Exterior Fire-Test Exposure: Class A; ASTM E 108, for application and roof slopes indicated.
 - 2. Fire-Resistance Ratings: ASTM E 119, for fire-resistance-rated roof assemblies of which roofing system is a part.
 - G. Wind Uplift Design: Provide roofing system that complies with the following:
 - 1. Roofing System Design: Provide a membrane roofing system that is identical to systems that have been successfully tested by a qualified testing and inspection agency to resist uplift pressures as indicated below and with a safety factor of two applied.
 - 2. 2018 IBC Chapter 16, Section 1609; required wind forces:
 - a. Exposure Category: Exposure C
 - b. Ultimate Design Wind Speed: 168 mph
 - c. Importance Factor: 1.5
 - d. Building Risk Category: IV
 - 3. Wind uplift pressures as indicated on the Structural Drawings.
 - a. Chapter 6 of ASCE/SEI 7 "Minimum Design Loads for Buildings and Other Structures".

1.03 SUBMITTALS

- A. Submit copy of statement, in an approved form, signed by the Roofing Subcontractor and Manufacturer, certifying that the products comply with these specifications and were the proper selections for the applications made, and that the installation methods complied with the manufacturer's printed instructions and their field representatives' verbal instructions and were proper and adequate for the condition of installation and use. Submit copy of roofing manufacturers accepted "notice of award" or equal that confirms that the manufacturer is aware of the project and has reviewed the system to be installed and that it is acceptable to the manufacturer.

February 27, 2026

- B. Product Data: For each type of product indicated.
- C. Installation Instructions: Complete instructions for handling, storage, priming, installation, and protection of the Thermoplastic Membrane Roof System.
- D. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other Work. Clearly show all adjacent materials for proper coordination. Drawings shall indicate the following:
 - 1. Base flashings and membrane terminations.
 - 2. Tapered insulation noting all slopes and elevations shall be incorporated into the overall shop drawings. R-values, materials, and attachments shall be clearly noted.
 - 3. Details of skylight units, vent pipes and all other project specific detail items shall be included.
 - 4. Associated sheet metal flashing systems shall be included in shop drawings and clearly detailed in coordination with adjacent exterior finish materials. Sheet metal items shall be clearly noted regarding gauge, profile, fastening and compliance with applicable anticipated project specific wind uplift forces.
 - 5. Wind uplift analysis signed and stamped by a qualified structural engineer licensed in the State of Hawaii including drawings showing size and types of fasteners, insulation fastening patterns for corners, perimeter, and field-of-roof locations.
- E. Samples
 - 1. 12-inch square field membrane and base flashing.
- F. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.
- G. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
 - 1. Submit evidence of meeting performance requirements.
 - 2. Statement that each product to be furnished is recommended for the application shown for this project.
- H. Qualification Data: For Installer and manufacturer.
- I. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of roofing system.
- J. Research/Evaluation Reports: For components of membrane roofing system.
- K. Maintenance Data: For roofing system to include in maintenance manuals.
- L. Warranties: Special warranties specified in this Section.
- M. Inspection Report: Copy of roofing system manufacturer's inspection report of completed roofing installation.

- N. Warranty Certification: Submit a signed certificate from the Manufacturer or its Technical Representative stating that the plans and specifications for the project have been reviewed and fully comply with the Manufacturer's standards and meet the requirements for the General and Special Warranties of the Complete Roofing System for the specified project.

1.04 QUALITY ASSURANCE

- A. Coordinate as required and be totally responsible for the full and satisfactory compatibility and performance between all Thermoplastic Membrane Roofing materials used under this section with all other applicable and related sections which may be in direct contact with work of this section.
- B. A project specific QA / QC manual shall be submitted by the Installer before any work has begun. This manual shall be reviewed at the pre-installation meeting and copies shall be kept at roof level in the possession of the Installer's supervisory personnel. Approved shop drawings and all other pertinent submittal materials shall be kept at roof level in the possession of the Installer's supervisory personnel.
- C. Take required steps and precautions to properly isolate and prevent of incompatibility between this system and adjacent work, in accordance with manufacturer's specifications, recommendations and instructions.
- D. Installer Qualifications: Engage a single firm to assume undivided responsibility for installing all components of the Roofing System including all related sheet metal flashings and all other components. Firm shall be approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product, with 3 years documented experience and that is eligible to receive manufacturer's warranty.
- E. Manufacturer Qualifications: A qualified manufacturer that has a minimum 20 years' experience in manufacturing the TPO membrane roofing system identical to that specified for this Project. Membrane manufacturers shall submit the following certification for review when making substitution requests or submittals.
- F. Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548.
- G. Source Limitations: Obtain components for membrane roofing system from roofing membrane manufacturer or materials and components certified by the roofing manufacturer as compatible with other system components.
- H. Preinstallation Conference: Prior to installation of roofing and associated work conduct conference at Project site. Comply with requirements in Section 01310 – PROJECT MANAGEMENT AND COORDINATION. Review methods and procedures related to roofing system including, but not limited to, the following:
 - 1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
 - 2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.

February 27, 2026

3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
 5. Review structural loading limitations of roof deck during and after roofing.
 6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
 7. Review governing regulations and requirements for insurance and certificates if applicable.
 8. Review temporary protection requirements for roofing system during and after installation.
 9. Review roof observation and repair procedures after roofing installation.
- I. Manufacturer's technical representative shall make periodic site visits and complete inspection reports that are submitted to the owner. At least one visit per roof area not including final inspections. Final inspections by the roofing membrane manufacturer shall be coordinated at least two weeks in advance with the Contractor and Owner / Owners' consultants so that their attendance can be properly coordinated. Final inspection reports and signed / completed punch list reports by the roofing membrane manufacturer shall be submitted to the owner. Submittal of the roofing warranty alone shall not be acceptable.
- J. The installation of pitch pockets is not acceptable. With proper coordination and planning they shall be avoided. Roof penetrations shall be properly coordinated and installed to meet the roofing manufacturer's requirements and NRCA guidelines. Conduit, vent pipe, supports, davits, or similar penetrations shall be round or square tube. Whenever possible, a pre-manufactured flashing shall be installed over such items before "connections" are made. If "split" flashings are required then they shall be manufacturer's pre-manufactured type, installed, if possible, before field fabricated flashings are installed.
- K. All TPO membrane roofing related sheet metal flashings specified in Section 07600 – FLASHING AND SHEET METAL shall be supplied by the roof system manufacturer as applicable and installed by the roofing contractor. Pre-manufactured coping and edge systems specified in Section 07600 – FLASHING AND SHEET METAL shall be included per the roofing manufacturer in the roofing systems warranty.
- L. At concrete roof deck areas, test for capillary moisture by plastic sheet method according to ASTM D 4263 or other manufactured approved method to properly determine if moisture content of concrete deck will allow for proper installation of roofing system. Waiting 28 days or more before installation over concrete deck areas is not an acceptable moisture test method.
- 1.05 DELIVERY, STORAGE, AND HANDLING
- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storing and mixing with other components.

February 27, 2026

- B. Outside storage of insulation in manufacturing packaging is not acceptable. Roofing insulation, along with all other roofing materials, shall be properly protected including, but not limited to, the use of water-resistant tarps.
- C. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
 - 1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- D. During installation, protect the roof deck and membranes with appropriate material such as plywood sheeting. Never scrape or puncture slip sheet or membranes. Keep roof surfaces free of soil, grit, or debris at all times with broom. Never set roof modules on top of soil, dirt, or grit.
- E. Transport conveyors to be run parallel to the line of installation.
- F. Transport carts to have pneumatic tires, to be wheeled about only upon protective plywood sheeting, and to be loaded so as not to exceed weight capacity of roof deck.
- G. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.06 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when current and extended forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.
 - 1. Do not apply roofing membrane during inclement weather.
 - 2. Do not apply roofing membrane to damp deck surface.
- B. All new and temporary construction, including equipment and accessories, shall be secured in such a manner as to preclude wind blow-off and subsequent roof or equipment damage.
- C. Arrange work sequence to avoid use of newly constructed roofing as a walking surface or for equipment movement and storage. Where such access is absolutely required, the Installer shall provide all necessary protection and barriers to segregate the work area and to prevent damage to adjacent areas. A substantial protection layer consisting of plywood over membrane or plywood over insulation board shall be provided for all new and existing roof areas that receive rooftop traffic during construction.
- D. Install only as much insulation and other roofing system materials that are vulnerable to sun and water damage, as can be made waterproof during the same day.

1.07 WARRANTY

- A. General Warranty: The Contractor shall submit a written guaranty on the roofing membrane system and sheet membrane flashing for a 2-year period after the date of Substantial Completion. The warranty shall provide the following at no cost to the Owner:

February 27, 2026

1. Repair of roofing and flashings as necessary to seal leaks, which are attributable to faulty materials and/or workmanship.
2. Repair or replacement of damage to the building and/or its finishes, equipment and/or furniture when occasioned by such leaks.
3. Inspection of the roofing and flashings together with the Owner or their designated representative, on or about the 1st and 2nd anniversaries of the date of Substantial Completion and repair or replacement of roofing and/or flashing as necessary to correct any deficiencies in workmanship or materials, such as by eliminating blisters exceeding 12 inches in any dimension or re-adhering open seams.

Such repair or replacement of roofing and/or flashings shall be done in a manner which will preserve the integrity of the roofing membrane.

- B. Special Warranty: Submit a written warranty, without monetary limitation, signed by roofing system manufacturer agreeing to repair or replace components of membrane roofing system that fail in materials or workmanship within specified warranty period. Failure includes roof leaks.

1. Special warranty includes roofing membrane, base flashings, roofing membrane accessories, roof insulation, fasteners, walkway products, overburden, roof related sheet metal edge flashing, and coping supplied by the roofing manufacturer.
2. Warranty Period: 20 years from date of Substantial Completion.
3. Wind Speed: Project Wind Speed as indicated in Article 1.02 of this Section. Note: All manufacturer material and installation requirements to obtain wind speed warranty shall be included by the installer.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Roofing Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. TPO Roofing Membrane:
 - a. Carlisle-Syntec; Sure-Weld Reinforced TPO 80-mil.
 - b. Firestone Building Products; Ultraply Platinum TPO Fully Adhered Roofing System.
 - c. GAF; EverGuard TPO 80 Membrane
 - d. or Approved Equal.
2. TPO Roofing Membrane with Fleece Back
 - a. Carlisle-Syntec: FleeceBACK TPO 135-mil
 - b. GAF; EverGard TPO Fleeceback 135-mil
 - c. Or Approved Equal.

2.02 ROOFING MEMBRANE

- A. Fabric-Reinforced Thermoplastic Polyolefin Roofing Membrane: ASTM D 6878, fabric or scrim internally reinforced uniform, flexible sheet.
 - 1. Thickness: 80 mils, nominal
 - 2. Exposed Face Color: White
 - a. Finished roof membrane shall have a Solar Reflectance Index (SRI) of no less than 99 (Initial) and no less than 85 (3-year aged) when tested in accordance with ASTM E1980.
- B. Fleece-Reinforced Thermoplastic Polyolefin Roofing Membrane: ASTM D6878, Scrim fully encapsulated, flexible sheet.
 - 1. Thickness: 135-mil
 - 2. Exposed Face Color: White
 - a. Finished roof membrane shall have a Solar Reflectance Index (SRI) of no less than 99 (Initial) and no less than 85 (3-year aged) when tested in accordance with ASTM E1980.
- C. Non-reinforced Flashing Membrane: Manufacturer's standard non-reinforced thermoplastic polyolefin sheet flashing 60-mil-thick of same color as sheet membrane.
- D. Cover Strip: ASTM D 6878; Reinforced 8-inch-wide thermoplastic polyolefin strip, 60-mil thick

2.03 AUXILLARY MATERIALS

- A. Membrane Bonding Adhesive: A solvent-based contact-type adhesive used to attach the membrane and flashing to the substrate. Consult Product Data Sheets for additional information and as recommended by insulation manufacturer.
- B. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening membrane to substrate and acceptable to membrane roofing system manufacturer.
- C. Seaming Material: Manufacturer's standard thermoplastic polyolefin 5-1/2-inch-wide minimum, 30 mil seaming tape.
- D. Lap Sealant: Manufacturer's standard single-component sealant, color to match roofing membrane.
- E. Cut Edge Sealant: Manufacturer's standard polymer-based sealant.
- F. Metal Termination Bars: Manufacturer's standard predrilled stainless-steel or aluminum bars, approximately 1 by 1/8-inch-thick; with anchors.
- G. Metal Battens: Manufacturer's standard aluminum-zinc-alloy-coated or zinc-coated steel sheet, approximately 1 inch wide by 0.05 inch thick, pre-punched.
- H. Miscellaneous Accessories: Provide pourable sealers, preformed cone, and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, in-seam sealants, termination reglets, cover strips, and other accessories.

February 27, 2026

- I. Thinner and Cleaner: As recommended by adhesive manufacturer, compatible with membrane.

2.04 ROOF UNDERLAYMENT BOARD

- A. Roof Underlayment Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, Type X, 5/8 inch thick.
 1. DensDeck Prime as manufactured by Georgia-Pacific Corporation or pre-approved equal.
- B. Substrate Joint Tape: 6- or 8-inch wide, coated, glass-fiber joint tape.
- C. Fasteners and Plates: Provide manufacturers heavy duty pre-assembled fastener and insulation plate design specifically to be used to attach underlayment board to roof deck.
 1. Metal Plate: Fabricated from Galvalume sheet steel; ASTM A 792, Class AZ50 coating designation, Grade 40.
 - a. Diameter: 3-inches.
 - b. Thickness: 0.17inch – 0.23 inch.
- D. Fastener: SAE 1022 heat treated steel with epoxy coating of length to be able to penetrate metal roof deck at the length required to withstand uplift forces.

2.05 ROOF INSULATION

- A. Polyisocyanurate Board Insulation: See SECTION 07210 BUILDING INSULATION. Also refer to Roofing Manufacturer Warranty requirements for insulation to meet Total System Warranty.
- B. Tapered Insulation: Polyisocyanurate, 25 psi compressive strength at areas to receive ISO insulation, fabricated to slope of 1/4-inch per ft. (unless otherwise noted). Positive drainage shall be provided for at all roof areas even if tapered insulation or crickets are not indicated on drawings. Provide for prefabricated drain sump panels per roofing manufacturer's recommendations. Cricket shall be fabricated and installed in coordination with deck slope and / or tapered insulation slope so that the "valley or flow line" is maximized based on 1/4" per ft deck or tapered insulation slope (one-to-one ratio architecture).
 1. Size for insulation board: Maximum 4 feet by 4 feet.
- C. Insulation Cover Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, Type X, 5/8 - inch thick.
 1. DensDeck Prime as manufactured by Georgia-Pacific Corporation or pre-approved equal.
- D. Substrate Joint Tape: 6- or 8-inch wide, coated, glass-fiber joint tape.
- E. Insulation Fasteners and Plates: Provide manufacturers heavy duty pre-assembled fastener and insulation plate design specifically to be used with manufacturer's roof insulation system.
 1. Metal Plate: Fabricated from Galvalume sheet steel; ASTM A 792, Class AZ50 coating designation, Grade 40.

February 27, 2026

- a. Diameter: 3-inches.
- b. Thickness: 0.17inch – 0.23 inch.
- 2. Fastener: SAE 1022 heat treated steel with epoxy coating of length to be able to penetrate metal roof deck at the length required to withstand uplift forces.
- F. Insulation manufacturer's recommended, low-rise, one-component or multi-component urethane adhesive formulated to attach roof insulation to substrate or to another insulation layer and that that has been tested as part of an assembly per requirements of 1.02 and 1.07 of this Section and allowed by roofing manufacturer to meet specified warranty and wind speed warranty.

2.06 ACCESSORIES

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatible with membrane roofing.
- B. Sealants: As recommended by the membrane manufacturer and specified in Section 07910 – EXTERIOR WALL JOINT SEALANTS.
- C. Wood Roof Nailer: As specified in Section 06100 – ROUGH CARPENTRY

2.07 FLASHINGS

- A. Flexible Flashing: Same material as membrane.
- B. Sheet Metal Flashing: Roof related sheet metal flashing as specified in Section 07600 - FLASHING AND SHEET METAL.

2.08 TRAFFIC PROTECTION

- A. Traffic Protection: Non-reinforced, thermoplastic, slip-resisting, surface-textured flexible walkway pads or rolls, approximately 5/32-inch thick, as indicated on drawings and acceptable to membrane roofing system manufacturer. Provide protection from foot traffic at entry and exit areas, to and around serviceable rooftop equipment, and in coordination with facade maintenance system (if applicable).
- B. Color to match roof membrane color.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
 - 1. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.
 - 2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.

3. Contractor shall engage a qualified independent testing and inspecting agency or the manufacturer's technical personnel to perform fastener pullout tests in accordance with the latest version of the SPRI/ANSI FX-1 "Standard Field Test Procedure for Determining the Withdrawal Resistance of Roofing Fasteners" to verify condition of the deck/substrate and to confirm required pullout values. Perform pullout test in various areas of the roof to include corner, perimeters, field and drain areas.
 - a. Number of pullout tests required: Minimum of 5
 - 1) 50 percent of the tests shall be performed in the corner and perimeter areas
 - b. Immediately inform the Architect if any of the pull-out tests reveal that the deck does not meet the minimum required pull values.
4. **[Verify that concrete substrates have cured and confirm that allowable moisture content with the roofing membrane and/or adhesive manufacturer before installation begins.]**
5. **Test for capillary moisture by plastic sheet method according to ASTM D 4263 and/or as noted in Article 1.04.**
6. **Verify that concrete curing compounds that may impair adhesion of the roof insulation or membrane is removed.]**
7. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- B. Mask off adjoining surfaces not receiving roofing membrane material to prevent spillage or over spray affecting other construction.
- C. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.
- D. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.
- E. All penetrations through the metal roof deck and adjacent areas shall be completely sealed to eliminate air penetration into the structure.

3.03 ROOF UNDERLAYMENT BOARD INSTALLATION

- A. Coordinate installing membrane roofing system components, so underlayment board or insulation is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with membrane roofing system manufacturer's written instructions for installing roof underlayment board.

February 27, 2026

- C. Install roof underlayment boards with long joints in continuous straight lines perpendicular to roof slopes with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction. Tightly butt underlayment boards together.
- D. Fasten underlayment board to metal roof deck to resist uplift pressure at corners, perimeter, and field of roof according to the approved Wind Uplift Analysis and membrane roofing system manufacturers' written instructions.

3.04 INSULATION AND COVER BOARD INSTALLATION

- A. Coordinate installing membrane roofing system components, so insulation is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with membrane roofing system manufacturer's written instructions for installing roof insulation.
- C. Install tapered insulation under area of roofing to conform to slopes indicated.
 - 1. Install tapered insulation per field conditions and to maintain a consistent thickness edge at roof edges and properly coordinated with the edge/gutter.
- D. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.
- E. Mechanically Fastened and Adhered Insulation: Install first layer of insulation to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.
 - 1. Mechanically fasten first layer of insulation to resist uplift pressure at corners, perimeter, and field of roof.
 - 2. Set each subsequent layer of insulation in insulation adhesive, firmly pressing, and maintaining insulation in place.
- F. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction. Loosely butt cover boards together and adhere to insulation. Fill gaps exceeding ¼" with insulation. Cut and fit insulation within ¼" of penetrations, nailers, and projections.
- G. **[Mechanically Fastened and Adhered Insulation: At metal deck, without concrete fill, install the first layer of insulation to the metal deck with mechanical fasteners per FMG's "Approval Guide" for specified Windstorm Resistance Classification. Install subsequent layers of insulation at those areas, as required per FM assembly testing, in cold adhesive and to achieve Factory Mutual Windstorm Resistance Classification. At concrete deck areas, install all layers of insulation in cold adhesive.]**
- H. Adhere cover boards to resist uplift pressure at corners, perimeter, and field of roof.

3.05 ADHERED ROOFING MEMBRANE INSTALLATION

- A. Install roofing membrane over area to receive roofing according to membrane roofing system manufacturer's written instructions.

February 27, 2026

- B. Unroll roofing membrane, without stretching, over the acceptable substrate and allow to relax for a minimum of 30 minutes prior to adhesion.
- C. Accurately align roofing membrane and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- D. Apply roofing membrane with side laps shingled with slope of roof deck where possible.
- E. Extend membrane up a minimum of 8 inches onto vertical surfaces.
- F. Bonding Adhesive: Apply bonding adhesive to substrate and underside of roofing membrane at rate required by manufacturer and allow to partially dry before installing roofing membrane. Do not apply bonding adhesive to splice area of roofing membrane. Roofing membrane shall be fully bonded to cover board. The use of low-rise or similar adhesives, and ribbon adhesive installation methods are not acceptable.
- G. Mechanically or adhesively fasten roofing membrane securely at terminations, penetrations, and perimeter of roofing.
- H. Adhesive Seam Installation: Clean both faces of splice areas, apply splicing cement, and firmly roll side and end laps of overlapping roofing membranes according to manufacturer's written instructions to ensure a watertight seam installation. **[Hot-air weld side and end laps of roofing membrane according to manufacturer's written instructions.]** Apply lap sealant and seal exposed edges of roofing membrane terminations.
- I. Strip in the seams for added protection in accordance with the manufacturer's instructions.
- J. Seal membrane around roof penetrations.

3.06 BASE FLASHING INSTALLATION

- A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions. Roofing membrane shall be adhered to the interior roofing parapet walls up to and under premanufactured sheet metal copings and/or edges.
- B. Apply solvent-based bonding adhesive to substrate and underside of sheet flashing at required rate and allow to partially dry. Do not apply bonding adhesive to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with sheet flashing. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.
- D. Clean seam areas and overlap and firmly roll sheet flashings into the adhesive. Weld side and end laps to ensure a watertight seam installation.

3.07 TRAFFIC PROTECTION INSTALLATION

- A. Flexible Walkways: Install walkway products in locations indicated. Adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

3.08 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified independent testing and inspecting agency to perform roof tests and inspections and to prepare test reports.
- B. The Contractor shall perform the work to patch a maximum of 5 “membrane” samples that may be taken by the testing / observation firm at any given roof area.
- C. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion of all areas and submit report to Architect. The Architect or Owner shall be notified of this inspection two weeks in advance.
- D. Provide periodic site observation by roofing, adhesive, and insulation materials manufacturer's representatives at the commencement, midpoint, and at completion of each stage of the roofing system work or at more frequent intervals if required by the manufacturer's extended warranty or required by this section.
- E. Repair or remove and replace components of membrane roofing system where test results or inspections indicate that they do not comply with specified requirements.
- F. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- G. Water Testing: All roof areas shall be water tested. Water testing shall consist of “sprinklers” or “soaker hoses” and does not imply flood testing. Water shall be allowed to run across all roof areas to drainage units for at least 2 hours at all areas. The Architect shall be notified 72 hours in advance of such testing. The Installer shall be responsible for interior observations of on-going testing to identify any water intrusion and to stop testing to minimize any interior damage.
 - 1. At time of water testing, if lack of positive drainage is noted, the Architect and Owner reserve the right to not accept the roofing membrane installation until such time that drainage issues are resolved.

3.09 PROTECTING AND CLEANING

- A. Clean adjacent surfaces free of materials resulting from this work as the work progresses. Use cleaning agent as recommended by roofing membrane manufacturer. Leave all finished work in a neat, clean condition.
- B. Protect membrane roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- C. Correct deficiencies in or remove membrane roofing system that does not comply with requirements, repair substrates, and repair or reinstall membrane roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements. The Architect and Owner reserves the right to accept “patches” at damaged or repair areas and / or require the installation of full width “sheets” of new membrane.
- D. Final cleaning shall be provided by the Roofing Subcontractor. The Architect and Owner reserve the right to not fully accept the roofing membrane system if the membrane is “dirty” and has not been cleaned.

February 27, 2026

END OF SECTION

SECTION 07600 - FLASHING AND SHEET METAL

PART 1 - GENERAL

1.01 SUMMARY

- A. Provide all labor, materials and equipment necessary to install flashing, counterflashing, gutters, scuppers, collector boxes and downspouts, steep-slope and low-slope flashing, and other related work as shown on drawings and as specified herein.
- B. All edge flashing and coping (where TPO membrane roofing is installed under coping or terminated with edge flashing) shall be provided by the TPO membrane roofing manufacturer, installed by the roofing contractor performing the work specified in Section 07541 – TPO MEMBRANE ROOFING and included in the TPO membrane roofing system warranty.

1.02 PERFORMANCE REQUIREMENTS

- A. General: Install sheet metal flashing and trim to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failing, rattling, leaking, and fastener disengagement.
- B. Wind Uplift Design: Provide metal flashing and counter-flashing that complies with the following:
 - 1. 2018 IBC Chapter 16 and ASCE 7 Chapter 6 for require wind forces:
 - a. Exposure Category: Exposure C
 - b. Basic Wind Speed: 1068 mph in 3 second gusts
 - c. Importance Factor: 1.5
 - 2. Metal edge flashings and copings of low-slope roofs shall comply with the requirements set forth by ANSI/SPRI ES-1.
- C. Thermal Movements: Provide sheet metal flashing and trim that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of sheet metal and trim thermal movements. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- D. Water Infiltration: Provide sheet metal flashing and trim that do not allow water infiltration to building interior.

1.03 SUBMITTALS

- A. General: Submit under provisions of Section 01330 – SUBMITTAL PROCEDURES.
- B. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes

- C. Shop Drawings: Submit shop drawings to the Contracting Officer for approval, showing layouts of sheet metal flashing and trim, including plans, elevations and details. Distinguish between shop and field assembly works. No fabrication will be permitted before approval is secured. Include the following:
 - 1. Identify material, thickness, weight, and finish for each item and location in Project.
 - 2. Details for forming sheet metal flashing and trim, including profiles, shapes, seams, and dimensions.
 - 3. Details for fastening, joining, supporting, and anchoring sheet metal flashing and trim, including fasteners, clips, cleats, and attachments to adjoining work.
 - 4. Details of expansion-joint covers, including showing direction of expansion and contraction.

1.04 QUALITY ASSURANCE

- A. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" and the NRCA's Roofing and Waterproofing Manual in coordination with requirements of roofing and waterproofing systems (the more stringent shall apply). Conform to dimensions and profiles shown unless more stringent requirements are indicated.
- B. ANSI/SPRI ES-1 Use the current edition of ANSI/SPRI ES-1 Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems. All configurations, gauges, attachments and other items shall meet or exceed testing and design criteria related to ES-1.
- C. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section.
 - 1. Meet with Contracting Officer, Architect, Engineer, Owner's insurer if applicable, Installer, and installers whose work interfaces with or affects sheet metal flashing and trim including installers of roofing materials and roof-mounted equipment.
 - 2. Review methods and procedures related to sheet metal flashing and trim.
 - 3. Examine substrate conditions for compliance with requirements, including flatness and attachment to structural members.
 - 4. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver sheet metal flashing materials and fabrications undamaged. Protect sheet metal flashing and trim materials and fabrications during transportation and handling.
- B. Unload, store, and install sheet metal flashing materials and fabrications in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack materials on platforms or pallets, covered with suitable weathertight and ventilated covering. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage.

February 27, 2026

1.06 COORDINATION

- A. Coordinate installation of sheet metal flashing and trim with interfacing and adjoining construction to provide a leakproof, secure, and noncorrosive installation.
- B. Fabricate flashings from materials noted below as most appropriate in regards to the system that the flashing is being integrated with and / or adjacent to and in coordination with the drawings and finish schedules. Concealed flashings may be mill finish.

1.07 WARRANTY

- A. The Contractor shall execute to the Owner a 5-year written warranty that the installation will be watertight and that any leaks which develop during that period which are not due to improper use or willful damage will be repaired at no cost to the Owner.
 - 1. Flashing for roofing to be performed by roofing contractor and be included in roofing warranty.
 - 2. Edge flashing and coping system shall be warranted to perform over the term of the specified roofing system warranty in Section 07541 – TPO MEMBRANE ROOFING and shall be warranted to not blow off or cause membrane failure, even in wind conditions up to 105 mph or the manufacturer shall replace or repair their materials.
- B. Special Warranty on Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Exposed Sheet Metal Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: 20 years from the Project Acceptance date.
- C. The Surety and the Contractor shall not be held liable beyond two years from the Project Acceptance date.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Asbestos Prohibition: No asbestos containing materials or equipment shall be used in this section. The Contractor shall ensure that all materials and equipment incorporated in the project are asbestos-free.
- B. Aluminum Sheet: ASTM B 209, alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required.

- C. Fasteners: Same material as flashing/sheet metal, or other noncorrosive metal as recommended by sheet manufacturer. Match finish of exposed heads with material being fastened.
 - 1. For attachment to wood substrates and blocking, provide 18-8/Type 304 stainless steel nails not less than 1-1/4-inch long, barbed with large head.
 - 2. For attachment to concrete or masonry provide 1/4-inch by 2-inches long, 18-8/Type 304 stainless steel drive pins with neoprene bonded stainless steel washers
- D. Lead Sheet for Vent Pipe Flashing: ASTM B 749, Grade B, copper bearing sheet lead, minimum 2-1/2 pounds per square foot, unless indicated otherwise.
- E. Isolation Membrane: ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, non-perforated. To be used to isolate flashing metal from dissimilar metals or corrosive substrates.
- F. Sealants and Sealant Tape: Comply with the requirements of Section 07910 – EXTERIOR WALL JOINT SEALANTS.
 - 1. Elastomeric Sealant: ASTM C 920, elastomeric silicone polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
 - 2. Sealing Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealing tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape.
 - 3. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant, polyisobutylene plasticized, heavy bodied for hooked-type expansion joints with limited movement.
- G. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
- H. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.02 FABRICATION

- A. General: Fabricate sheet metal copings and low-slope roof edge systems to comply with ANSI/SPRI ES-1 and all other flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated. Shop fabricate items where practicable. Obtain field measurements for accurate fit before shop fabrication.
- B. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
- C. Fabricate sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
 - 1. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- D. Reglets: Units of type, material, and profile indicated, formed to provide secure interlocking of separate reglet and counter-flashing pieces, and compatible with flashing indicated with factory-mitered and -welded corners and junctions and interlocking counter-flashing on exterior face, of same metal as reglet.

February 27, 2026

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Fry Reglet Corporation.
 - b. Heckmann Building Products Inc.
 - c. Hickman, W. P. Company
2. Material: 0.024-inch aluminum sheet.
3. Siding Type: Provide with upturned fastening flange and extension leg of length to match thickness of applied finish materials.
4. Surface-Mounted Type: Provide with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.
5. Finished to match flashings.
- E. Sealed Joints: Form non-expansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA recommendations.
- F. Expansion Provisions: Where lapped or bayonet-type expansion provisions in the Work cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with elastomeric sealant concealed within joints.
- G. Conceal fasteners and expansion provisions where possible on exposed-to-view sheet metal flashing and trim, unless otherwise indicated.
- H. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
 1. Thickness: As required by ANSI/SPRI ES-1 for copings and low-slope roof edge systems and for all other flashing and trims as recommended by SMACNA's "Architectural Sheet Metal Manual" for application but not less than thickness of metal being secured.

2.03 GUTTERS AND DOWNSPOUTS AT LOW SLOPE ROOFS

- A. Gutters: Formed to cross section indicated, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 96-inch- long sections. Furnish flat-stock gutter spacers and gutter brackets fabricated from same metal as gutters of size and metal thickness according to SMACNA's "Architectural Sheet Metal Manual." but not less than twice the gutter thickness. Space gutter supports a maximum of 36 inches o.c. Fabricate expansion joints, expansion-joint covers and gutter accessories from same metal as gutters.
 1. Gutter Profile: As indicated
 2. Sheet Metal Thickness: 0.040-inch
 3. Fabricate and locate lap type expansion joints in compliance with SMACNA recommendations for the material specified. Expansion joint to be type as shown in Figure 1-6 in the SMACNA "Architectural Sheet Metal Manual".
 4. Provide stainless steel wire ball strainers of compatible metal at outlets
- B. Downspouts: Fabricate round downspouts from 0.032-inch thick aluminum sheet complete with mitered elbows. Furnish with metal hangers, from 0.063-inch thick aluminum sheet, and anchors.
 1. Hanger Style: As detailed or if not detailed per SMACNA figure designation 1-35D.

2.04 PRE-MANUFACTURED EDGE FLASHING AND COPING SYSTEMS

- A. Roof-Edge Flashing: Metal roof edge fascia with continuous coated steel waterdam. The system shall be watertight, maintenance free, not requiring exposed fasteners. Joints shall be a butt type with concealed splice plates.
1. Fabricate fascia cover from 0.040-inch aluminum in standard 12-foot long sections. Vertical face length as detailed.
 2. Concealed Splice Plates: Fabricate concealed splice plates in 12-inch widths of same thickness as fascia.
 3. Waterdam: Shall be continuous 24-gauge, pre-punched, Kynar coated steel waterdam in standard lengths of 12-feet. Mechanically fastened as indicated and detailed.
 4. Fasteners: 1-1/4-inch Type 316 stainless steel ring shank roofing nails.
 5. Manufacturers:
 - a. Firestone Building Products; UNA-Edge DE
 - b. Carlisle-Syntec; SecurEdge 3000
 - c. GAF; EverGuard Drip Edge
 - d. Or approved equal
- B. Copings: Metal coping cap with coated steel anchor/support cleats. The system shall be watertight, maintenance free, not requiring exposed fasteners. Joints shall be a butt type with concealed splice plates.
1. Fabricate copings cover from 0.040-inch aluminum in minimum lengths of 96-inch and not exceeding 12-foot long sections. Vertical face and back leg lengths as detailed.
 2. Concealed Splice Plates: Fabricate concealed splice plates in 8-inch widths of same thickness as copings.
 3. Anchor/Cleats: 22-gauge, pre-punched Kynar coated steel cleat with stainless steel spring mechanically locked to cleat 12-inches wide at 3-feet on center. Mechanically fastened as indicated and detailed.
 4. Fasteners (Wood Substrate): #9 x 1½" stainless steel fasteners with provided drivers. No exposed fasteners shall be permitted. Fasteners shall be electrolytically compatible.
 5. Fasteners (Concrete Substrate): 1/4-inch diameter by 1-1/4-inch long Tapcon fasteners.
 6. Manufacturers:
 - a. Firestone Building Products; UNA-Edge CO Coping System
 - b. Carlisle-Syntec; SecurEdge 200 Coping
 - c. GAF; EverGuard M-Weld Formed Coping
 - d. Or approved equal

2.05 LOW SLOPE ROOF FLASHING

- A. Base and Counter Flashings: to be fabricated from Aluminum sheet of the following thicknesses:

February 27, 2026

1. Base Flashing – 0.040-inch.
 2. Counter Flashing – 0.032-inch.
- B. Roof Penetration Flashing: Fabricate from 0.040-inch. aluminum sheet.

2.06 STEEP SLOPE ROOF FLASHING

- A. Eave, Hip, Ridge, Rake, Valley, Pan, Drip Edge, Apron, Step, Cricket, and Backer Flashing: Fabricate from same material as metal roofing panels specified in Section 07410 – STANDING SEAM METAL ROOF PANELS.

2.07 WALL FLASHING

- A. Openings Flashing in Frame Construction: Fabricate head, sill and similar flashings to extend a minimum of 4 inches beyond wall openings. Form head and sill flashing with 2-inch high end dams.
1. At Windows and Doors:
 - a. Aluminum Windows and Doors: Fabricate from 0.062-inch aluminum sheet.
 - b. Steel Doors: Fabricate from 0.034-inch aluminum-zinc coated steel sheet.
 2. Color to match color of window or door trim.

2.08 FINISHES

- A. Finishes: Three-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
1. Humidity Resistance: 2000 hours.
 2. Salt-Spray Resistance: 2000 hours.
 3. Color:
 - a. Downspouts, scuppers, collection boxes, coping drip edges and roof flashing
 - 1) As selected by Contracting Officer.
 - b. Wall opening flashings at windows and doors
 - 1) Custom color to match door and window frame color.
 - c. Wall Joint flashing
 - 1) Custom color to match wall color.

PART 3 - EXECUTION

3.01 INSTALLATION AND WORKMANSHIP

- A. Surface to which sheet metal is to be applied shall be even, smooth, sound, thoroughly clean and dry, and free from defects that might affect the application. Report any unsatisfactory surfaces to the Contracting Officer. In the absence of such a report, the Contractor shall be held responsible for the finished product.

- B. All accessories or other items essential for the completeness of the sheet metal installation, though not specifically indicated on the drawings or specified, shall be provided. All such items unless otherwise indicated on the drawings or specified, shall be of the same kind of materials as the item to be applied. Nails, screws, rivets, and bolts shall be of the type best suited for the purpose intended and shall be of a composition that is compatible with the metal to which it will contact.
- C. Except as otherwise indicated on the drawings or specified, the workmanship of sheet metal work, method of forming joints, anchoring, cleating, provisions for expansion, etc., shall conform to the standards details and recommendations of the Sheet Metal and Air Conditioning Contractors National Association's "Architectural Sheet Metal Manual" and shall be subject to the approval of the Contracting Officer.
 - 1. Torch cutting of sheet metal flashing and trim is not permitted.
- D. All sheet metal work shall be watertight and wind-tight in compliance with the purpose intended for the items indicated on the drawings or specified herein.
- E. Install sheet metal flashing and trim true to line and levels indicated without excessive oil canning, buckling and tool marks. Provide uniform, neat seams with minimum exposure of solder, welds, and elastomeric sealant.
- F. Cleating: Cleats for sheet metal work shall be provided continuous, unless otherwise indicated on the drawings. Cleats shall be of the same material and weight as the metal being installed.
- G. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1-inch deep, filled with elastomeric sealant concealed within joints.
- H. Fasteners: Use fasteners of types and sizes indicated that will penetrate substrate not less than 1-1/4 inches.
- I. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1 inch into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 deg F, set joint members for 50 percent movement either way. Adjust setting proportionately for installation at higher ambient temperatures.
 - 1. Prepare joints and apply sealants to comply with requirements in Section 07910 – EXTERIOR WALL JOINT SEALANTS.
- J. Reglets: Type and size as indicated.
- K. Protection from Contact of Dissimilar Materials: Surfaces in contact with dissimilar metal shall be painted with heavy-bodied bituminous paint or shall be separated by means of moisture-proof building felts.

3.02 DOWNSPOUT INSTALLATION

- A. Downspouts: Join sections with 1-1/2-inch telescoping joints. Provide fasteners and hangers designed to hold downspouts securely 1-inch away from walls; locate hangers at top and bottom.

- B. Downspout indicated to empty on to splash blocks, provide elbows at base of downspout to direct water away from the wall.

3.03 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
- B. Copings and Edge Flashing at Low Slope Applications: Anchor to resist uplift and outward forces and comply with the requirements set forth by ANSI/SPRI ES-1
- C. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches over base flashing. Lap counterflashing joints a minimum of 4 inches and bed with sealant. Secure in a waterproof manner by means of anchor and washer at 36-inch centers unless otherwise indicated.
- D. Steep Slope Roof Flashing: Install in accordance with Section 07410 – STANDING SEAM METAL ROOF PANELS.

3.04 WALL FLASHING INSTALLATION

- A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to SMACNA recommendations and as indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.
- B. Opening Flashings in Frame Construction: Install continuous head, sill, and similar flashings to extend 4 inches beyond wall openings.
 - 1. Form end dams in sill flashing at each where flashing meets jamb. Turn metal up jamb a minimum of 2-inches.

3.05 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder and sealants.
- C. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain in a clean condition during construction.
- D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.
- E. Protect all sheet metal work until final acceptance of the building.
- F. At completion of the work, clean up and remove all rubbish and debris from the premises which resulted from this work.

February 27, 2026

END OF SECTION

SECTION 07811 – SPRAY APPLIED FIREPROOFING

PART 1 - GENERAL

1.01 SUMMARY

- A. Extent of spray applied fireproofing is indicated on the drawings and by provisions of this section. Provide all labor, materials, equipment, and services necessary for, and incidental to, the complete and proper installation of spray applied fireproofing in accordance with the current building code requirements and the requirements of all authorities having jurisdiction.
- B. Related Work Described Elsewhere:
 - 1. Section 05120 – STRUCTURAL STEEL
 - 2. Section 07270 – PENETRATION FIRESTOPPING.

1.02 SUBMITTALS

- A. Submit under provisions of Section 01330 – SUBMITTAL PROCEDURES.
- B. Manufacturer's Data and Instructions: Manufacturer's data and instructions for applying spray-on fireproofing shall be submitted.
- C. Samples: One 18-inch square sample for each type of fireproofing and a one-quart container of each brand and type of adhesive and sealer shall be submitted.
- D. Sample Installations: A sample area of a minimum of 100 square feet shall be submitted. The sample area will be representative of typical installation of fireproofing including beams and attachments. Apply fireproofing material for the sample area with the same equipment, materials and procedures used in the work. The sample area shall be approved prior to proceeding with fireproofing work in any other areas. Use the approved sample area as a reference standard for thickness, density and texture and keep in place and open for observation until all spray-applied fireproofing is approved. Sample area shall become part of the work after all areas to be fireproofed are completed and accepted by the Architect.
- E. Statements: Before application, a certificate shall be submitted certifying that surfaces receiving sprayed fire protection material have been inspected by the applicator or manufacturer's representative and are acceptable to receive sprayed fire protection material.
- F. Test Reports: A complete report and test records from a certified independent laboratory shall be submitted, attesting that the fireproofing material and installation procedures conform to the requirements of paragraph "Field Quality Control" of this section. Performance test reports shall conform to the requirements of the applicable test method.
- G. Installer Qualifications: Installer of spray applied fireproofing shall be certified and licensed to perform this work in the State of Hawaii and shall furnish qualifications that include examples of at least 3 installations of equal or larger scope and size from this project within the last 6 years.

1.03 DELIVERY AND STORAGE

- A. Deliver materials to job site in original sealed packages and containers properly marked and labeled to show manufacturer's name, brand, and certification of compliance with the requirements of paragraphs "Fire Hazard Classifications" and "Fire Resistance Rating", of this section. Packaging shall bear the UL labels for fire hazard and fire resistance classifications. Keep fireproofing materials dry until ready to be used and stored off the ground, under cover and away from damp surfaces. Damaged or open containers may be rejected. Materials with shelf-life shall be applied prior to expiration of the shelf-life period.

1.04 ENVIRONMENTAL CONDITIONS

- A. Relative Humidity: Maintain relative humidity within the limits recommended by the fireproofing manufacturer.
- B. Ventilation: Provide adequate ventilation to dry the fireproofing after application. Provide forced air circulation for enclosed areas without adequate natural ventilation.

PART 2 - PRODUCTS

2.01 CONCEALED SPRAY APPLIED FIREPROOFING

- A. Product: Subject to compliance with requirements, provide Isolatek International Corp.; CAFCO BLAZE-SHIELD II or a comparable product by one of the following:
 - 1. Carboline Co., Fireproofing Products Division
 - 2. Grace, W. R. & Co. – Conn., Construction Products Division
 - 3. Or approved equal.
- B. Material Composition: Manufacturer's standard product:
 - 1. Concealed Cementitious spray applied fireproofing: Factory-mixed, dry formulation of gypsum or Portland cement binders, additives, and lightweight mineral or synthetic aggregates mixed with water at Project site to form a slurry or mortar for conveyance and application.
- C. Physical Properties: Minimum values, unless otherwise indicated, or higher values require to attain designated fire-resistance ratings, measured per standard test methods referenced with each property as follows:
 - 1. Dry Density: 15 pcf for average and individual densities, or greater if required to attain fire-resistance ratings indicated, per ASTM E 605 or AWCI Technical Manual 12-A, Section 5.4.5, "Displaced Method."
 - 2. Thickness: Minimum average thickness required for fire-resistance design indicated according to the following criteria, but not less than 0.375-inch, per ASTM E 605:
 - a. Where the referenced fire-resistance design lists a thickness of 1-inch or more, the minimum allowable individual thickness of spray applied fireproofing is the design thickness minus 0.25-inch.

- b. Where the referenced fire-resistance design lists a thickness of less than 1-inch, but more than 0.375-inch, the minimum allowable individual thickness of spray applied fireproofing is the greater of 0.375-inch or 75 percent of the design thickness.
 - c. No reduction in average thickness is permitted for those fire-resistance designs whose fire-resistance ratings were established at densities of less than 15 pcf.
- 3. Bond Strength: 150 psf minimum per ASTM E 736 based on laboratory testing of 0.75-inch minimum thickness of spray applied fireproofing.
 - 4. Compressive Strength: 750 psf minimum per ASTM E 761. Minimum thickness of spray applied fireproofing tested shall be 0.75-inch and minimum dry density shall be as specified but not less than 15 pcf.
 - 5. Corrosion Resistance: No evidence of corrosion per ASTM E 937.
 - 6. Deflection: No cracking, spalling, or delamination per ASTM E 759.
 - 7. Effect of Impact on Bonding: No cracking, spalling, or delamination per ASTM E 760.
 - 8. Air Erosion: Maximum weight loss of 0.025 g per square foot in 24 hours per ASTM E 859. For laboratory tests, minimum thickness of spray applied fireproofing is 0.75-inch, maximum dry density is 15 pcf, test specimens are not prepurged by mechanically induced air velocities, and tests are terminated after 24 hours.
 - 9. Fire-Test-Response Characteristics: Provide spray applied fireproofing with the following surface-burning characteristics as determined by testing identical products per ASTM E 84 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
 - a. Flame-Spread Index: 0.
 - b. Smoke-Developed Index: 0.

2.02 AUXILIARY FIRE-RESISTIVE MATERIALS

- A. General: Provide auxiliary fire-resistive materials that are compatible with spray applied fireproofing and substrates and are approved by UL or another testing and inspecting agency acceptable to authorities having jurisdiction for use in fire-resistance designs indicated.
- B. Substrate Primers: For use on each substrate and with each sprayed fire-resistive product, provide primer that complies with one or more of the following requirements:
 - 1. Primer's bond strength complies with requirements specified in UL's "Fire Resistance Directory" for coating materials based on a series of bond tests per ASTM E 736.
 - 2. Primer is identical to those used in assemblies tested for fire-test-response characteristics of spray applied fireproofing per ASTM E 119 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
- C. Adhesive for Bonding Fire-Resistive Material: Product approved by manufacturer of spray applied fireproofing.

- D. Metal Lath: Expanded metal lath fabricated from minimum 3.4 lbs/sq.yd., G60 galvanized steel required to comply with fire-resistance designs indicated and fire-resistive material manufacturer's written recommendations. Include clips, lathing accessories, corner beads, and other anchorage devices required to attach lath to substrates and to receive spray applied fireproofing.

PART 3 - EXECUTION

3.01 SURFACE PREPARATION

- A. Surfaces with unacceptable substrate shall be brought to the attention of the Contracting Officer. Clear ceiling areas to be fireproofed of obstructions interfering with the application of the spray-applied fireproofing. Install support sleeves, inserts, clips, hanger attachment devices, and the like prior to the application of the fireproofing. Verify that existing hanger attachment devices are properly seated prior to application of the fireproofing.
- B. All costs associated with removal of primers or application of new primers for installation of spray-applied fireproofing shall be included in the contract price and without any additional cost to the Owner.

3.02 SURFACE ACCEPTABILITY

- A. Obtain approval from the Architect for surfaces to receive sprayed fireproofing prior to application of fireproofing material and certify them to be clean and in acceptable condition for application of spray-applied fireproofing. Test new and existing painted steel surfaces in accordance with ASTM E 119 with the spray applied fireproofing material.

3.03 MIXING

- A. Mix fireproofing materials in strict accordance with the manufacturer's recommendations. Mechanically control the material to water ratio.

3.04 EXTENT OF FIREPROOFING

- A. Protect steel beams, steel decking and other structural steel members with the spray-applied fireproofing unless otherwise specified.
- B. Patch and repair steel columns, beams, metal decks, and other structural steel members that have been protected with the spray-applied fireproofing which have been damaged or removed from demolition and renovation work and as indicated on the Drawings.

3.05 APPLICATION

- A. Construct fireproofing assemblies that are identical to fire-resistance design indicated and products as specified, tested, and substantiated by test reports; for thickness, primers, sealers, topcoats, finishing, and other materials and procedures affecting fireproofing work.
- B. Apply fireproofing material prior to the installation of ductwork, piping, and conduits. Prior to spray application, cover surfaces not to receive spray-applied fireproofing, including instruments, gauges, and equipment to prevent

- contamination by splatter, rebound and overspray. Cover openings in areas to receive spray-applied fireproofing prior to and during application of fireproofing with tarpaulins or other approved material.
- C. Apply fireproofing material to a thickness as required to obtain the specified fire resistance rating and to provide a fire-protective coating of uniform density and texture.
 - D. Apply fireproofing in accordance with the procedure recommended by the manufacturer. Allow no traffic on platform during application and during curing period.
 - E. Metal Decks: Do not apply fireproofing to underside of metal roof deck until roofing has been completed; prohibit roof traffic during application and drying of fireproofing.
 - F. Install metal lath as required, to comply with fire-resistance ratings and fire-resistive material manufacturer's written recommendations for conditions of exposure and intended use. Securely attach lath to substrate in position required for support and reinforcement of fire-resistive material. Use anchorage devices of type recommended in writing by spray applied fireproofing manufacturer. Attach accessories where indicated or required for secure attachment of lath to substrate.

3.06 FIELD QUALITY CONTROL

- A. Special Inspections: Contractor will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections in accordance with Chapter 17 of the current IBC and prepare test reports.
- B. Testing Agency: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
- C. Inspections:
 - 1. Structural Member Surface Conditions
 - 2. Application
 - 3. Thickness
 - 4. Density
 - 5. Bond Strength
- D. Test sprayed material for thickness and density in accordance with ASTM E 605, by an approved independent testing laboratory.
 - 1. Thickness: Take thickness determinations at metal deck, joists, beams, and columns. Areas showing a thickness less than required will be rejected.
 - 2. Density: Take density determinations from beam bottom flange, beam web, and an equivalent area from the top of the lower beam flange. Areas showing a density less than specified will be rejected.
- E. Bond Strength shall be determined in accordance with ASTM E 736, by an approved independent testing laboratory.
 - 1. Bond Strength: Take in-place samples for determining the cohesive/adhesive strength of spray-applied fire-resistant materials from the following:

February 27, 2026

- a. Floor, Roof, Wall Assemblies: Each floor, roof, and wall assembly at rate of not less than one sample for every 10,000 square feet or part thereof of the sprayed area in each story.
 - b. Structural Framing: Beams, girders, joists, trusses, and columns at rate of not less than one sample for each type of structural framing member for each 10,000 square feet or part thereof of the sprayed area in each story.
2. Areas showing a psf bond strength of less than that noted in Article 2.01-C-3 will be rejected.
- F. Repair and Replacement: Remove, repair, and replace spray-applied fire-resistant material that did not pass tests and inspections or was damaged during testing in accordance with the manufacturer's instructions. Conduct final inspection of sprayed areas. Inspect fireproofed surfaces after mechanical, electrical, and other work in contact with fireproofing material have been completed and before sprayed material is covered. Respray areas requiring additional fireproofing material to provide proper thickness for the specified fire resistance rating.
- G. Prepare and submit test and inspection reports.

3.07 CLEANUP, PROTECTING AND REPAIR

- A. Cleaning: Immediately after completing spraying operations in each containable area of Project, remove material overspray and fallout from surfaces of other construction and clean exposed surfaces to remove evidence of soiling.
- B. Protect SFRM, according to advice of product manufacturer and Installer, from damage resulting from construction operations or other causes so fire protection will be without damage or deterioration at time of Substantial Completion.
- C. Coordinate application of SFRM with other construction to minimize need to cut or remove fire protection. As installation of other construction proceeds, inspect SFRM and patch any damaged or removed areas.
- D. Repair or replace work that has not successfully protected steel.

END OF SECTION

SECTION 07910 – EXTERIOR WALL JOINT SEALANTS

PART 1 - GENERAL

1.01 SUMMARY

- A. This section includes joint preparation, joint packing, priming, caulking and sealing indicated by the Contract Documents and furnish all supplementary items necessary to completely seal the joints in the facade such as those joints in the aluminum windows and doors, precast concrete wall panels, metal wall panels and other exterior joints as required, indicated or specified in the Contract Documents using approved sealant technique, with weeps or vents as required. Furnishing and installing of sealants and backer rods for visual mockup specimens are also included as part of this work.
- B. Related Work:
 - 1. Section 07600 – FLASHING AND SHEET METAL
 - 2. Section 07920 – SEALANTS for sealants used elsewhere on the project.
 - 3. Section 08520 – GLAZED ALUMINUM SYSTEMS
 - 4. Section 08800 - GLAZING.

1.02 REFERENCES

- A. The work of this section shall comply with the latest edition of the following standards. When conflicts arise between standards, the more stringent applies.
 - 1. AAMA – Architectural Aluminum Manufacturers Association
 - a. AAMA 800, Test Methods for Sealants
 - b. AAMA CW-13 Structural Sealant Glazing Systems
 - 2. American Society for Testing and Materials.
 - a. ASTM C509, Specification for Elastomeric Cellular Preformed Gasket and Sealing Material
 - b. ASTM C718, Test Method for Ultraviolet (UV) Cold Box Exposure of One-Part Elastomeric, Solvent-Release Type Sealants
 - c. ASTM C719, Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle)
 - d. ASTM C793, Test Method for Effects of Accelerated Weathering on Elastomeric Joint Sealants
 - e. ASTM C 1184 – Standard Specification for Structural Silicone Sealants.
 - f. ASTM C1401, Guide for Structural Sealant Glazing
 - g. ASTM D2203, Test Method for Staining from Sealants
 - 3. Federal Specification TT-S - 00230C and TT-S-001543A.
 - 4. The 2018 International Building Code.

1.03 QUALITY ASSURANCE

- A. The character of these requirements is intended to provide a performance type specification for the design selection and installation of the exterior wall sealants. The exterior sealant sub-contractor is responsible for the design selection and installation of the sealants, as well as the performance of the sealant system.
- B. Except as otherwise indicated, joint sealants are required to establish and maintain airtight and waterproof continuous seals on a permanent basis, with recognized limitations of wear and aging as indicated for each application. Failures of installed sealants to comply with these requirements will be recognized as failures of materials and workmanship.
- C. To the greatest extent possible, engage a single firm to assume undivided responsibility for sealing all components of the exterior facade. This firm must demonstrate not less than 10 years successful experience in installation of work similar to the work of this Project. Credentials and data must be submitted to Contracting Officer for review and approval.
 - 1. If a single firm cannot be engaged to assume undivided responsibility for sealing all components of the exterior façade, coordinate between the different contractors and their work to provide sealant from the same manufacturer and of the same type to assure continuity and compatibility for sealed joints throughout the entire exterior façade.
- D. The manufacturer of sealants used for exterior sealants shall provide additional on-site testing by authorized personnel, in addition to the sealant tests specified in herein, to assure that materials are suitable for the application, have not suffered detrimental loss of shelf life, and will be fully covered by the warranty in event of failure or staining of the sealed components including stone.
 - 1. Method(s) of testing is at manufacturer's option.
 - 2. Provide testing as follows to demonstrate curing properties:
 - a. Between 24 and 72 hours prior to initial application.
 - b. Prior to use of each new shipment of materials.
 - c. Not less than twice a month for existing stored materials.
 - 3. Manufacturer and contractor shall submit log of testing, on company letterhead for each test performed indicating, but not limited to the following:
 - a. Date.
 - b. Project identification.
 - c. Sealant identification including name, type and batch number.
 - d. Test performance, i.e., acceptable, marginal, not acceptable.
 - e. Storage conditions.
 - f. Signature of person conducting test.
- E. If tests that indicate sealant material are marginal or not acceptable, it shall not be used. Tester to immediately notify Contracting Officer and Contractor. The contractor shall immediately remove materials from site.

- F. Manufacturer of sealants for exterior building enclosure shall provide instruction to the exterior sealant subcontractor foreman and mechanics, and Contractor on proper installation techniques required to achieve maximum life and weather tightness from the sealant installation. Special emphasis shall be directed to practices required to avoid staining or other changes in appearance of sealed components such as stone in the completed work.
- G. Materials and workmanship are subject to review by the Contracting Officer at all times. Such review inspections do not relieve the facade sealants subcontractor from obligations to provide a watertight and weather tight seal at all facade systems, surfaces, and related materials.

1.04 SUBMITTALS

- A. Submit under the provisions of Section 01330 – SUBMITTAL PROCEDURES.
- B. Submit the following information from the manufacturer:
 - 1. Certification in the form of standard data sheet or letter that each type of compound and sealant to be furnished complies with these specifications.
 - 2. Statement that each product to be furnished is recommended for the application shown for this project.
 - 3. Complete instructions for handling, storage, mixing, priming, installation, curing and protection of each type of sealant.
 - 4. Certification in writing that sealant will not cause staining nor change appearance of adjacent substrate materials.
- C. Submit 5 samples of specified products, 12 in. long and installed between samples of the materials to be sealed for the Project. Contracting Officer's acceptance will be for color only. Compliance with other requirements is the sealant Contractor's responsibility.
- D. Submit copy of statement, in an approved form, signed by the Contractor and manufacturer, certifying that the products comply with these specifications and were the proper selections for the applications made, and that the installation methods complied with the manufacturer's printed instructions and their field representatives' verbal instructions and were proper and adequate for the condition of installation and use.
- E. For each type aluminum window and exterior substrate used provide test reports per ASTM E 575 on materials and methods proposed for this project which will demonstrate successful behavior of sealant systems under limiting design stresses with respect to adhesion, compatibility, migration, stability, cohesion, staining, recovering and any other deleterious effects. Provide a procedure detailing the cleaning, priming, taping, tooling and other steps recommended to ensure satisfactory function and appearance.
 - 1. Submit, for record only, sealant manufacturer's test reports for weather seal silicone adhesion to all relevant substrates. Tests must include twenty-one-day water immersion after which silicone must have excellent adhesion to substrates. Report adhesion strength in terms of shear stress and tensile stress. Test samples shall approximate sealant joint sizes and configurations intended for production materials.

February 27, 2026

2. Submit documentation of product performance as required per ASTM C 920. Also, perform the same testing but substitute actual job substrate materials in lieu of standard test materials, e.g. in ASTM C 510, use job stone samples in lieu of white cement mortar. Long-term behavior, under compression shall be tested.
 3. Submit, for record only, sealant manufacturer's test report for staining of all relevant substrates. Test samples shall approximate sealant joint sizes and configurations intended for production materials.
- F. Provide a procedure detailing the cleaning, priming, taping, tooling and other steps recommended to ensure satisfactory function and appearance.
- G. Submit copy of pigtail type field adhesion tests results.

1.05 JOB CONDITIONS

- A. Examine joint surfaces and backing, and their anchorage to the structure, and conditions under which joint sealer work is to be performed and notify Contractor in writing of conditions detrimental to proper completion of the work and performance of sealers. Do not proceed with joint sealer work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.
- B. Weather Conditions: Do not proceed with installation of sealants under adverse weather conditions. Proceed with the work only when weather conditions are favorable for proper cure and development of high early bond strength.

1.06 INSPECTIONS

- A. Coordinate as required and be totally responsible for the full and satisfactory compatibility and performance between all sealants used under this Section with all other applicable and related Sections using sealants which may be in direct contact with work of this Section or adjacent to other work.
- B. Take required steps and precautions to properly isolate and prevent incompatibility between said sealants in accordance with manufacturer's specifications, recommendations and instructions.
- C. Periodically test sealants in place in addition to the manufacturer's field testing, for adhesion, using methods recommended by sealant manufacturer. Promptly replace sealant, which does not adhere or fails to cure.
- D. Contractor shall arrange to meet the sealant manufacturer at the jobsite and witness initial installation of sealant on the project wall with the Contractor and Contracting Officer.

1.07 PRODUCT HANDLING

- A. Quality Standard: AAMA CW-10
- B. Delivery: Deliver sealants to the jobsite in sealed containers labeled to show the designated name, formula, or specification number, lot number, color, date of manufacture, shelf life, curing time, manufacturer's directions, and name of manufacturer.

February 27, 2026

- C. Storage: Carefully handle and store all materials to prevent inclusion of foreign materials. Remove from project site all damaged and deteriorated materials and materials exceeding shelf life.
- D. All sealant materials shall be installed prior to expiration of shelf life. Remove all sealant materials that have exceeded their maximum shelf-life from the jobsite.

1.08 SEALANT TESTING

- A. Provide to sealant manufacturer samples of all relevant substrates, including but not limited to finished aluminum, wood, concrete, stainless steel, vision glass, gaskets, spacers, setting blocks and backers as well as any other material which will contact the sealant either during installation or normal wall movements.
 - 1. For each type of substrate provide test reports per ASTM E575.
 - 2. Submit documentation of product performance as required per ASTM C920. Also, perform the same testing but substitute actual job substrate materials in lieu of standard test materials, e.g. in ASTM C510, use job stone samples in lieu of white cement mortar. Long-term behavior, under compression shall be tested.
- B. Tests on substrate materials must include the use of the same sealants on the project, including the project color.
- C. Test samples shall approximate sealant joint sizes and configurations intended for production materials.
- D. Sealant manufacturer shall perform the following tests on weather seal sealant against all substrates to verify:
 - 1. ASTM C794 – Adhesion
 - a. Test must include 21-day water immersion after which silicone must have excellent adhesion to substrates.
 - b. Report adhesion strength in terms of shear stress and tensile stress.
 - 2. ASTM C1087 – Compatibility
 - 3. ASTM C1248 – Staining or migration on porous substrates
 - a. Tests must be performed both wet and dry. Substrate must not experience waterproofing of the substrate surface beyond the sealant joint.
- E. Structural Silicone Quality Control
 - 1. Submit Quality Control Program to include the tests as specified in PART 2 “Source Quality Control” Article.
 - 2. Method procedure for sealing, bonding and testing of the structural silicone per sealant Manufacturer’s recommendations.
 - 3. Detailed re-glaze procedures for vision and spandrel glass.
 - 4. Field inspection procedure for the perimeter seal on the laminated units and other structural silicone bonds. This procedure should spell out yearly inspections for the first 10 years, and thereafter 2 inspections per year.

February 27, 2026

5. Prior to the approval of structural silicone designs, laboratory testing for adhesion of a minimum of 3 samples after water immersion of 7 days is required.
6. Sealant methods and test method results must be verified by an independent inspection agency, a minimum of once per shift.
7. The sealant manufacturer must run UV and water immersion tests proving compatibility and performance of all spacers, backers, primers, finishes, etc.
8. All glass in the structural silicone curtain wall system shall be structurally bonded to metal framing with two component structural silicone. This operation must be performed in the off-site factory with rigidly supervised conditions and methods.
9. Working stress of silicone and the silicone bond must be limited to 20 psi.
10. Structural bond of silicone to glass and metal must be inspected on a 100% basis.

1.09 WARRANTY

A. Special Warranty:

1. Submit a written warranty agreeing to repair or replace sealant compounds which have failed to provide airtight and watertight joints for any reason, or which appear to have failed in adhesion, cohesion, abrasion-resistance, migration-resistance, stain-resistance, general durability or any other form of apparent deterioration (excluding inherent qualities and limitations clearly specified in the manufacturer's data which was submitted).
2. The warranty to be provided shall be for full replacement for a period of 5 years from the date of Project Acceptance.
3. A warranty that is to be provided by the sealant manufacturer shall consist of a 20-year labor and material warranty matching that provided by Dow Corning Corporation or GE Silicones. Warranty shall be signed by both the Exterior Wall Contractor and the Sealant Manufacturer.
 - a. The surety shall not be liable beyond two years of the Project Acceptance date.
 - b. Warranty period to commence on date of Project Acceptance.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Asbestos Prohibition: No asbestos containing materials or equipment shall be used in this section. The Contractor shall ensure that all materials and equipment incorporated in the project are asbestos-free.
- B. Foam Backer Rods:
 1. Preformed joint filler, non-staining. Diameter approximately 25 percent larger than joint width, unless otherwise directed by manufacturer.

February 27, 2026

2. Bi-cellular Structure with Surface Skin: ASTM C 1330, Type B, non-gassing, extruded polyolefin; acceptable to joint sealant manufacturer.
 - a. Available Manufacturers and Products:
 - 1) Nomaco Inc.; SOF-Rod (Dual-Rod) Backer Rod
 - 2) BASF; Sonneborn, Sonolastic Soft Backer Rod: Degussa
 - 3) Industrial Thermo Polymers LTD.; Soft-Type Insulating Backer Rod
 - 4) Or approved equal.
3. Closed Cell Structure: ASTM C 1330, Type C, non-gassing, extruded polyethylene; acceptable to joint sealant manufacturer.
 - a. Available Manufacturers and Products:
 - 1) Backer Rod Manufacturing, Inc.; Mile High Foam Backer Rod.
 - 2) BASF; Sonneborn, Closed-Cell Backer Rod.
 - 3) Industrial Thermo Polymers LTD.; ITP Std. Insulating Backer Rod.
 - 4) Nomaco Inc.; Green Rod or HBR Backer Rod
 - 5) Or approved equal.
4. Open Cell Structure: ASTM C 1330, Type O, extruded polyurethane, acceptable to joint sealant manufacturer.
 - a. Available Manufacturers and Products:
 - 1) Backer Rod Manufacturing, Inc.; Denver Foam Backer Rod.
 - 2) Industrial Thermo Polymers LTD.; Tundra Open Cell Foam Backer Rod.
 - 3) Nomaco Inc.; Foam-Pak II Backer Rod.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer in writing to the Contracting Officer.
- D. Masking Tape: Non-staining, nonabsorbent type compatible with joint sealants and to surfaces adjacent to joints.
- E. Primer as recommended by manufacturer of sealant in writing to the Contracting Officer, having been tested for staining and durability on samples of actual surfaces to be sealed. In the case of structural silicone use with fluoropolymer coatings, primer must be used
- F. Sealants:
 1. At Exterior Vertical And Overhead Moving Joints, including interior and exterior perimeter seals around windows and louvers (**JS-01**): Medium Modulus Silicone Sealant, one-part, non acidic, neutral curing, Type S, Grade NS, Class 50, Use NT, capable of withstanding movements from plus 50% to minus 50% based on original joint design. All sealants that are used must be SWRI certified and comply with ASTM C920. Provide one of the following:
 - a. GE Silpruf SC 2000

- b. Dow Corning 795
- 2. Silicone Weather Barrier Sealant (**JS-02**): One-part, neutral curing, Type S, Grade NS, Class 25, Use NT, compatible with weather barriers specified in Section 07250 – WEATHER BARRIERS. All sealants that are used must be SWRI certified and comply with ASTM C920. Provide the following:
 - a. Dow Corning 758 Silicone Weather Barrier Sealant
 - b. Or Approved equal.
- 3. Low Modulus Silicone Sealant (**JS-03**): One-part, non-acidic, neutral curing, Type S, Grade NS, Class 50, Use NT, capable of withstanding movements from plus 100% to minus 50% based on original joint design. All sealants that are used must be SWRI certified and comply with ASTM C920.
 - a. Dow Corning Corp.; 790.
 - b. Momentive Performance Materials, Inc., GE Commercial Sealants; SilPruf LM SCS2700.
 - c. Pecora Corp.; 890.
 - d. Only low modulus sealants shall be used when sealing joints in precast concrete wall panel system.
- 4. Structural Sealant (**SSG**): SWRI Certified, ASTM C 1184, single or two component, neutral-curing silicone formulation compatible with system components with which it comes in contact, specifically formulated and tested for use as structural sealant, and approved by structural-sealant manufacturer for use in metal-framed window ventilators indicated.
 - a. Two Component for Shop Installation: Type M, Grade NS, Class 12-1/2 or 25, Use NT, G, A, O.
 - 1) Manufacturers
 - a) Dow Corning Corp.; 983.
 - b) Momentive Performance Materials, Inc., GE Commercial Sealants; UltraGlaze SSG4400, SSG4600.
 - c) Pecora Corp.; 985
 - b. One Component for Field Installation: Type S, Grade NS, Class 25 or 50, Use NT, G, A, O.
 - 1) Manufacturers
 - a) Dow Corning Corp.; 995 and 795.
 - b) Momentive Performance Materials, Inc., GE Commercial Sealants; UltraGlaze SSG2000, Silpruf SCS2000, UltraGlaze SSG4000
 - c) Pecora Corp.; 895NST

G. Accessories:

- 1. Cleaners for Non-Porous Surfaces: Chemical cleaners recommended by sealant manufacturer in writing, free of harming residues, non-staining, and formulated to promote optimum adhesion.

2. MEK, Toluene or Xylene are not acceptable except in cases of extreme cleaning conditions.

2.02 SOURCE QUALITY CONTROL

- A. Fabricator Testing: Fabricator shall, through its own laboratory testing, perform source quality control testing to establish compliance with specified requirements.
- B. Structural sealant testing during fabrication of unitized panels (Location: Manufacturer's or Glazing Contractor's assembly and glazing facility)
 1. Methods:
 - a. Product Mix Check: Butterfly Test.
 - b. Work Life Check: Snap Time Test.
 - c. Adhesion
 - d. Ratio Check (By Weight)
 - e. Finished Unit De-Glazing
 - 1) 1 out of the first 10 finished units
 - 2) 1 out of the first 40 finished units
 - 3) 1 of the next 50 finished units
 - 4) 1 of each subsequent 100 units (until project completion) once 10 successive, successful de-glazing tests are experienced.
 - f. Execute a full negative design pressure test of one full size unit randomly selected from the production line at the minimum rate of 1 every 50 units.
 - 1) The test units might be used on the project at the conclusion of successful test results.
 2. A failure of any tested unit will require the testing of the 2 units manufactured immediately before and after the failed unit. Depending on the success or failure of subsequent tests, and the determination of cause of initial failure, additional tests may be required.
 3. All samples must demonstrate the ability to surpass a tensile load per linear centimeter equivalent to three times the design pressure.
 4. Testing shall be witnessed, and results recorded by a Professional Engineer or an independent testing laboratory.
 5. Additional tests as required by Sealant Manufacturer
- C. Reports: Maintain log indicating tests conducted, sealant lot numbers, dates, times, results.

PART 3 - EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

- A. Comply with manufacturer's printed instructions except where more stringent requirements are shown or specified, and except where manufacturer's technical representative directs otherwise.

3.02 EXAMINATION

- A. Prior to installation of sealant, and at the Contractor's direction, meet at the Project site to review the material selections, joint preparations, installation procedures, weather conditions and coordination with other trades.
 - 1. Meeting shall include the sealants subcontractor, Contractor, Contracting Officer, Architect, manufacturer's representative, and representatives of other trades or subcontractors affected by the sealant installation.
 - 2. Examine sample installations, which have been prepared and determine and record whether everyone present is in agreement that the proposed installations are likely to perform as required.
 - 3. Accepted control section shall be standard to which all other sealant work must conform.
- B. Examine the substrates, adjoining construction and the conditions under which the work is to be installed. Correct unsatisfactory conditions before proceeding with work.

3.03 JOINT PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealers to comply with recommendations of joint sealer manufacturers and the following requirements:
 - 1. Remove all foreign material from joint substrates which could interfere with adhesion of joint sealer, including dust; paints, except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer; oil; grease; waterproofing; water repellants; water; and surface dirt.
 - 2. Remove protective coatings on metal surfaces with a solvent that leaves no residue. Use clean white cloths or lintless paper towels for cleaning with solvent and drying. Clean joint areas protected with masking tape or strippable film with solvent after removal of tape or film. Do not allow solvent to air dry without wiping.
 - 3. Remove laitance by acid washing, grinding or mechanical abrading. Remove form oils by sand or water-blast cleaning. Remove loose particles present or resulting from grinding, abrading or blast cleaning by blowing out joints with oil free compressed air or by vacuuming joint prior to application of primer or sealant.
 - 4. Steel Surfaces in Contact with Sealant: Scrape and wirebrush to remove loose mill scale. Remove dirt, oil, or grease by solvent cleaning, and wipe surfaces with clean cloths.

5. Clean metal, glass, glazed surfaces of ceramic tile, and other nonporous surfaces by chemical cleaners or other means which are not harmful to substrates or leave residues capable of interfering with adhesion of joint sealers.
 6. Joint widths, depths, and conditions detailed on shop drawings by related trades shall be considered as minimum allowable requirements except where they may conflict with sealant manufacturer's recommendations. In all cases, joints must be uniform in width. Do not seal joints until they are in compliance with Drawings, or meet the control section standard.
 7. Clean out and rake to full width and depth, joints to receive sealant, backup material or preformed joint filler. Make joints of sufficient width and depth to accommodate specified back-up material or preformed joint filler and sealant.
- B. Joint Priming: Prime joint substrates where indicated or where recommended by joint sealer manufacturer based on preconstruction joint sealer-substrate tests or prior experience. Apply primer to comply with joint sealer manufacturer's recommendations. Confine primers to areas of joint sealer bond, do not allow spillage or migration onto adjoining surfaces.
- C. Priming of surfaces receiving Structural Silicone Sealant
1. Prior to installing two-part fast cure structural sealant, abrade fluoropolymer painted substrate with alcohol soaked "scotch brite" pads and wipe clean with a lint-free rag.
 2. Any primers that are used with the structural silicone shall be pre-approved in writing by the sealant manufacturer for the noted application and environment including specific installation and handling instructions. No structurally glazed unit shall be moved prior to sample testing that shows 100% cohesive failure has been achieved.
- D. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces which otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.04 INSTALLATION OF JOINT SEALERS

- A. General: Follow sealant manufacturer's instruction regarding surface preparation, priming, application life, and application procedure. Consult sealant manufacturer for recommendation for application procedure. Consult sealant manufacturer for recommendation for application of sealant when air temperature is below 40 degrees F., or surface temperatures of sealant contact surfaces are above 120 degrees F.
- B. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications and conditions indicated.
- C. Installation of Sealant Backings: Install sealant backings to comply with the following requirements:
1. Install back-up material or joint filler at proper depth in joint to provide specified sealant dimensions. Compress back-up material 25% to 50% into

the joints as required. Do not apply sealant without back-up materials. Install bond breaker strip between sealant and non-release type backup material. 3-side adhesion is acceptable only for the sealing at joinery of members that are to be rigidly attached to each other by means of screws or welding restricting movement.

- a. Do not leave gaps between ends of joint fillers.
 - b. Do not stretch, twist, puncture, or tear joint fillers.
 - c. Remove absorbent joint fillers which have become wet prior to sealant application and replace with dry material.
2. Install bond breaker tape between sealants and joint fillers, compression seats, or back of joints where adhesion of sealant to surfaces at back of joints would result in sealant failure.
 3. Install compressible seals serving as sealant backings to comply with requirements indicated above for joint fillers.
- D. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths which allow optimum sealant movement capability.
- E. Structural Sealant Installation:
1. Comply with the requirements in Section 08800- GLAZING
- F. Dual Sealant Installation:
1. Use open-cell backer rod to ensure full cure of the back weatherseal. If closed-cell backer rod is used, the back weatherseal must be fully cured prior to the installation of the exterior seal.
 2. Ensure joint dimension is at least 3/4-inch wide to install rear sealant.
- G. Tooling of Nonsag Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents which discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.
1. Provide concave joint configuration per Figure 8A in ASTM C 1193, unless otherwise indicated.
 2. Provide flush joint configuration per Figure 8B in ASTM C 1193, where indicated.

3.05 FIELD QUALITY CONTROL

- A. Test facade sealant work in the field during the testing of the other exterior building facade elements. Area and time of test shall in accordance with Contracting Officer's recommendation. Perform out of sequence or scheduled sealant installation at test areas as necessary and as directed so that the testing of the facade elements can be performed at the specified intervals of erection.
- B. Refer to related Sections for criteria pertaining to field testing.

February 27, 2026

- C. Perform and record results of pig-tail type adhesion tests on at least 2 different elevations per floor as the work progresses.
- D. Field Adhesion and Cohesion Testing: Sealant manufacturer representative will perform a minimum of 20 field tests to determine if installed work complies with specified requirements. Tests to be witnessed by Contracting Officer and Architect. Test sealant after it has fully cured (7-21 days).
 - 1. Provide testing as follows to demonstrate curing properties:
 - 2. Between 24 and 72 hours prior to initial application.
 - 3. Prior to use of each new shipment of materials.
 - 4. Not less than twice a month for existing stored materials
- E. Testing of Field Installed Structural Silicone.
 - 1. Vertical must be tested at a rate of 1 light out of each 100 lights of glass. Silicone shall be cut out and all silicone joints inspected during production on the job site
- F. Reports: Record test results and prepare reports according to ASTM E 575 and ASTM C 1521 formats.
- G. Re-testing and Re-inspections Due to Failures:
 - 1. Perform further testing to ascertain the extent of the problem. All failed sealants are to be replaced promptly and the resulting weather tightness must be verified.
 - 2. Remove from site marginal or defective material.
 - 3. Contractor responsible for expenses incurred, without additional cost to Owner, due to failure of work to pass testing and inspections.
- H. Repairs for Destructive Testing:
 - 1. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints.
 - 2. Ensure original sealant surfaces are clean and new sealant properly contacts original sealant.

3.06 CLEAN UP

- A. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealers and of products in which joints occur.

3.07 PROTECTION

- A. Protect joint sealers during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealers immediately and reseal joints with new materials to produce joint sealer installations with repaired areas indistinguishable from original work.

February 27, 2026

END OF SECTION

SECTION 07920 - SEALANTS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes: All sealants not covered in Section 07910 – EXTERIOR WALL JOINT SEALANTS and Section 07922 – SECURITY SEALANTS. Completely close with sealant all joints indicated or specified to be sealed to a watertight condition.
- B. Related Sections:
 - 1. Section 07910 – EXTERIOR WALL JOINT SEALANTS

1.02 SUBMITTALS

- A. Submit under the provisions of Section 01330 – SUBMITTAL PROCEDURES.
- B. Manufacturer's Data: Submit copies of manufacturer's product data and specifications for type of sealant required, to the Contracting Officer for approval.
- C. Material Safety Data Sheets (MSDS): Submit MSDS for each sealant product.
- D. Color Samples: Submit sets of color finish samples of sealants.

1.03 JOB CONDITIONS

- A. Examine joint surfaces and backing, and their anchorage to the structure, and conditions under which joint sealer work is to be performed and notify Contractor in writing of conditions detrimental to proper completion of the work and performance of sealers. Do not proceed with joint sealer work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.
- B. Weather Conditions: Do not proceed with installation of sealants under adverse weather conditions. Proceed with the work only when weather conditions are favorable for proper cure and development of high early bond strength.

1.04 PRODUCT HANDLING

- A. Delivery: Deliver sealants to the jobsite in sealed containers labeled to show the designated name, formula, or specification number, lot number, color, date of manufacture, shelf life, curing time, manufacturer's directions, and name of manufacturer.
- B. Storage: Carefully handle and store all materials to prevent inclusion of foreign materials. Remove from project site all damaged and deteriorated materials and materials exceeding shelf life.
- C. All sealant materials shall be installed prior to expiration of shelf life.

1.05 WARRANTY

- A. Provide a 2-year written warranty against leaks, air infiltration, cracks, and other failures of the installation and materials.
 - 1. Repair of sealants to seal leaks caused by faulty materials or workmanship;
 - 2. Repair or replace damage to the building or its finishes, equipment or furniture when occasioned by such leaks.

3. Warranty period to commence on date of Project Acceptance.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Asbestos Prohibition: No asbestos containing materials or equipment shall be used in this section. The Contractor shall ensure that all materials and equipment incorporated in the project are asbestos-free.
- B. Sealant Backer Rod: Compressible rod stock of polyethylene foam, polyethylene-jacketed polyurethane foam, neoprene foam or other flexible, permanent, durable, nonabsorptive material as recommended for compatibility with sealant by the sealant manufacturer to control the joint depth for sealant placement, to break bond of sealant at bottom of joint, to form optimum shape of sealant bead on back side, and to provide a highly compressible backer which will minimize the possibility of sealant extrusion when joint is compressed. Do not use oakum or other types of absorptive materials as backstops.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer.
- D. Masking Tape: Non-staining, nonabsorbent type compatible with joint sealants and to surfaces adjacent to joints.
- E. Primer for Sealants: Non-staining, as recommended by the sealant manufacturer.
- F. Sealants: All site-applied, interior sealants shall have a VOC of not more than 250 g/L
 1. At Interior Vertical and Overhead Moving Joints (**JS-04**) except at tile joints: One-part polyurethane-based sealant, conforming to ASTM C 920, Type S, Grade NS, Class 25, Use NT. Provide products from one of the following, or approved equal:
 - a. Tremco, Inc.
 - b. Bostik Construction Products Div.
 - c. Sika Corp.
 - d. Pecora Corp.
 - e. Sonneborn.
 2. At Interior Vertical and Overhead Non-Moving Joints (**JS-05**): Non-Elastomeric Sealant; acrylic-emulsion type, conforming to ASTM C 834. Provide one of the following, or approved equal:
 - a. AC-20 Acrylic Latex: Pecora Corp.
 - b. Tremco Acrylic Latex 834; Tremco, Inc.
 - c. Chem-Calk 600; Bostik Construction Products Div.
 - d. Sonolac; Sonneborn.
 3. At Horizontal Traffic-Bearing Joints (**JS-06**): Two-part polyurethane based sealant, conforming to ASTM C 920, Type M, Grade P, Class 25, Use T. Provide one of the following, or an approved equal:

- a. Sikaflex 2c SL; Sika Corp.
 - b. THC-900; Tremco, Inc.
 - c. Urexpan NR-300; Type HM; Pecora Corp.
 - d. SL-2; Sonneborn.
4. Silicone Sealant (**JS-07**): At Perimeter of All Plumbing Fixtures and Fittings and wall and floor tile movement joints: One-part mildew-resistant silicone sealant conforming to ASTM C 920, Type S, Grade NS, Class 25, Use NT, formulated with fungicide; intended for sealing interior joints with non-porous substrates. For use in kitchens and food preparation areas provide sealant complying with FDA requirements. Provide one of the following, or approved equal:
- a. Dow Corning 786; Dow Corning Corp.
 - b. SCS 1702 Sanitary; General Electric Co.
 - c. Tremsil 600 White; Tremco, Inc.
 - d. Omni Plus; Sonneborn.
 - e. 898 or 893, No. 345; Pecora Corp.
5. Bedding Compound: For installation of thresholds and similar items indicated to be bedded in sealant, use a preformed butyl-polyisobutylene sealant tape. Size of tape as required for the specific application. Provide one of the following, or approved equal:
- a. Extru-Seal; Pecora Corp.
 - b. 440 Tape; Tremco, Inc.
 - c. Chem-Tape 40; Bostik Construction Products Div.
6. Acoustical Sealant: Provide one of the following, or approved equal:
- a. Fire-rated and Non-rated Exposed Joints and Fire-rated Concealed Joints (**JS-08**): Non-sag, paintable, non-staining, latex sealant complying with ASTM C 834, ASTM A 119 or ANSI/UL 263 that effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90 as well and resists the spread of fire and passage of smoke and other gases, and maintain original fire-resistance rating of assemblies in or between which the sealant is installed.
 - 1) AC-20 FTR; Pecora Corp.
 - 2) Sheetrock Acoustical Sealant; USG
 - b. Non-Rated Concealed Joints (**JS-09**): Non-drying, non-hardening, non-skinning, non-staining, gunnable, synthetic-rubber sealant recommended for sealing interior concealed joints to reduce airborne sound transmission.
 - 1) BA-98; Pecora Corp.
 - 2) Tremco Acoustical Sealant; Tremco.
 - 3) Pro-Series SC-170; Ohio Sealants.

PART 3 - EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

- A. Comply with manufacturer's printed instructions except where more stringent requirements are shown or specified, and except where manufacturer's technical representative directs otherwise.

3.02 EXAMINATION

- A. Examine joints indicated to receive joint sealers, with Installer present, for compliance with requirements for joint configuration, installation tolerances and other conditions affecting joint sealer performance. Do not proceed with installation of joint sealers until unsatisfactory conditions have been corrected.

3.03 JOINT PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealers to comply with recommendations of joint sealer manufacturers and the following requirements:
 - 1. Remove all foreign material from joint substrates which could interfere with adhesion of joint sealer, including dust; paints, except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer; oil; grease; waterproofing; water repellants; water; and surface dirt.
 - 2. Clean unglazed surfaces of ceramic tile and similar porous joint substrate surfaces, by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealers. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
 - 3. Remove laitance and form release agents from concrete.
 - 4. Steel Surfaces in Contact with Sealant: Scrape and wirebrush to remove loose mill scale. Remove dirt, oil, or grease by solvent cleaning, and wipe surfaces with clean cloths.
 - 5. Clean metal, glass, glazed surfaces of ceramic tile, and other nonporous surfaces by chemical cleaners or other means which are not harmful to substrates or leave residues capable of interfering with adhesion of joint sealers.
- B. Joint Priming: Prime joint substrates where indicated or where recommended by joint sealer manufacturer based on preconstruction joint sealer-substrate tests or prior experience. Apply primer to comply with joint sealer manufacturer's recommendations. Confine primers to areas of joint sealer bond, do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces which otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.04 INSTALLATION OF JOINT SEALERS

- A. General: Comply with joint sealer manufacturers' printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply. Do not apply sealant on wet surfaces or when the surface temperature exceeds 130 degrees F.
- B. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications and conditions indicated.
- C. Acoustical Sealant Application Standard: Comply with recommendations of ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.
- D. Installation of Sealant Backings: Install sealant backings to comply with the following requirements:
 - 1. Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths which allow optimum sealant movement capability.
 - a. Do not leave gaps between ends of joint fillers.
 - b. Do not stretch, twist, puncture, or tear joint fillers.
 - c. Remove absorbent joint fillers which have become wet prior to sealant application and replace with dry material.
 - 2. Install bond breaker tape between sealants and joint fillers, compression seats, or back of joints where adhesion of sealant to surfaces at back of joints would result in sealant failure.
 - 3. Install compressible seals serving as sealant backings to comply with requirements indicated above for joint fillers.
- E. Primer: Immediately prior to application of the sealant, clean out all loose particles from joints. Where recommended by sealant manufacturer, apply primer to joints in wood and other porous surfaces in accordance with compound manufacturer's instructions. Do not apply primer to exposed finish surfaces.
- F. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths which allow optimum sealant movement capability.
- G. Tooling of Nonsag Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents which discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.
 - 1. Provide concave joint configuration per Figure 8A in ASTM C 1193, unless otherwise indicated.
 - 2. Provide flush joint configuration per Figure 8B in ASTM C 1193, where indicated.

February 27, 2026

- H. Showers: Apply sealant to all penetrations through the finish materials, at flanges, escutcheons and cover plates.

3.05 CLEAN UP

- A. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealers and of products in which joints occur.

3.06 PROTECTION

- A. Protect joint sealers during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Project Acceptance. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealers immediately and reseal joints with new materials to produce joint sealer installations with repaired areas indistinguishable from original work.

END OF SECTION

SECTION 07950 – EXTERIOR EXPANSION JOINT ASSEMBLIES

PART 1 – GENERAL

1.01 SUMMARY

- A. Section includes: Exterior expansion control systems and accessories.
- B. Provide all labor, materials and services to perform operations in connection with furnishing, delivery, and installation of work related to this section.
- C. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- D. Related work not included in this section:
 - 1. Section 03300 - CAST-IN-PLACE CONCRETE
 - 2. Section 07540 – TOP MEMBRANE ROOFING
 - 3. Section 07910 – EXTERIOR WALL JOINT SEALANTS

1.02 CODES AND STANDARDS

- A. Work shall be performed following applicable Local, State, and Federal codes and regulations.
- B. Publications listed herein are part of this specification. See below for standards where applicable to the product listed:
 - 1. American Society for Testing and Materials (ASTM):
 - a. ASTM E1399 “Cyclic Movement and Measuring of Minimum/Maximum Joint Widths of Architectural Joint Systems.”
 - b. ANSI/U.L. No. 263, UL2079, ULCS115, EN1366-4 Fire Rated Testing for full rated period. Underwriter’s Laboratories shall classify adjacent substrate assemblies.
 - c. ASTM E1612, Standard Specification for Preformed Architectural Compression Seals for Buildings and Parking Structures.
 - 2. American National Standards Institute (ANSI):
 - a. ANSI A137.1/A326.3 (2018), “Method for Measuring Dynamic Coefficient of Friction on Hard Flooring Materials”

1.03 DRAWINGS AND SPECIFICATIONS

- A. Contract Drawings are diagrammatic. The details shown are intended as a guide for the aesthetic and interfacing requirements of the various components of the exterior assembly to and with other work; details are intended to establish basic dimensions of the module and the sight lines, jointing and profiles of members. The Contractor is responsible for the design and engineering of the system within these aesthetic parameters. The drawings are not to be construed as engineering design, or adequate to meet the engineering design requirements.

- B. Design conditions not included in Contract Drawings shall be developed through the Contractor's shop drawings in compliance with these specifications. Architect shall have the final say as to all matters whether detailed or not on the architectural design details.

1.04 DEFINITIONS

- A. Product Movement capabilities
 - 1. Product operating range defined as a percentage of the nominal joint width.
 - 2. Industry standard requirements: 25%+- operating range for thermal conditions. 50%+- operating range for seismic and windsway conditions.
 - 3. Lateral shear capable systems allow for movement parallel to joint orientation.

1.05 SYSTEM DESCRIPTION

- A. Joint coverplate systems shall permit daily thermal expansion and contraction of building elements, minor foundation settlement, and common windsway movements of the structure without disengagement.
 - 1. Joint system details shall clearly indicate X-axis joint movement capabilities (horizontal contraction/ expansion). Y-axis joint movement (in-plane shear), and Z-axis movement (vertical shear) may be requested of the Manufacturer if applicable.
 - 2. Movement capabilities shall be clearly defined as a percentage of the nominal joint width or with distinct dimensions defined on product details.
- B. Joint Systems shall allow for seismic movement (if applicable), matching requirements as defined within the Project Specific Structural Specifications.
- C. Fire Rated Assemblies shall be tested by registered Third Party Testing Agencies in accordance with UL2079. Expansion joint assembly fire rating shall match or exceed the fire rating of adjacent construction.

1.06 QUALITY ASSURANCE

- A. Architectural Joint Cover Manufacturer: Furnish horizontal and vertical systems from a Manufacturer with a minimum of ten (10) years of experience in the design, engineering and fabrication of expansion joint systems.
- B. Fire Rated Assembly Manufacturer: Furnish horizontal and vertical rated systems from a single Manufacturer to ensure compatibility. Intersection of/ or transition between dissimilar systems is not allowed unless reviewed and approved by AHJ.
- C. Installer: Contractor with not less than three (3) years of successful experience in the installation of systems similar to those required by Project.

1.07 SUBMITTALS

- A. Manufacturer's Specifications, technical data, installation instructions, and detail drawings for each proposed system.
- B. Listings/ Certifications of all Fire Rated Assemblies secured through Registered Third Party Testing Agency.
- C. Representative sample of specified systems 6-inch minimum length.

1.07 DELIVERY AND STORAGE

- A. Manufacturer to provide protective film on all exposed cover plate components.
- B. Deliver joint systems to jobsite in new, clean, unopened cartons or crates of sufficient size and strength to protect materials during transit.
- C. Inspect materials upon arrival. Store components in original containers in a clean, dry location. Ensure temperature or moisture sensitive components are stored in a tempered location.
- D. Contractor to provide temporary protective covers on all installed finished surfaces. Protection is required to guard against both surface abrasions as well as overloading of horizontal deck components by construction traffic.

1.11 WARRANTY

- A. Standard Emseal Joint Systems Ltd. limited warranty against material and manufacturing defects for a period of not less than five (5) years when installed in accordance with Manufacturer's recommendations.

PART 2 – PRODUCTS

2.01 MANUFACTURER

- A. Manufacturer must be capable of providing a full range Interior and Exterior Architectural Joint Cover systems as well as a full complement of expansion joint accessories.
- B. Manufacturer must be capable of providing project specific details accurate to the building construction type.
- C. Substitutions: Not permitted.
- D. Requests for substitutions will be considered in accordance with provisions of Section 01630 PRODUCT OPTIONS AND SUBSTITUTIONS.

2.02 MATERIALS

- A. Deck and Parking Joint Seal:
 - 1. Subject to compliance with the requirements of the drawings and specifications, provide Emshield DFR2 as manufactured by Emseal Joint Systems Ltd.
 - 2. Description: Traffic grade upper and lower silicone sealing surface adhered to fire retardant impregnated foam backing installed into a field-applied epoxy adhesive.
 - 3. Form: Precompressed to less than nominal material size for installation into designed joint size equal to material nominal size
 - 4. Fire Protection Rating: Precompressed to less than nominal material size for installation into designed joint size equal to material nominal size.
 - 5. Movement Capability: Plus or minus 50 percent, total 100 percent.
 - 6. Color: To be selected by architect from manufacturers full color range.
 - 7. Adhesive: Epoxy type, furnished by joint seal manufacturer.

8. Silicone: Field applied sealant band at face of seal to substrate interface, furnished by joint sealant manufacturer; same material and color as factory coating.
 - a. Abrasion Resistance: Maximum 1 percent weight loss, tested to ASTM D4060.
 - b. Fuel Resistance: Pass ASTM C719 and ASTM C1135.
9. Intumescant Sealant: Field applied to face of joints, furnished by joint seal manufacturer.

PART 3 – EXECUTION

3.01 INSPECTION

- A. Prior to starting work, verify that structural gap and blockout dimensions are in conformance with manufacturer's submittal data. Do not begin work until all unsatisfactory substrate conditions are resolved. See manufacturer for recommended tolerances.
- B. Carefully inspect installed work of other Trades and verify that such work is complete to allow the work of this section to commence.
- C. Schedule inspection of all Waterproofing measures and Fire Rated life safety product prior to installation of expansion joint system.
- D. Clean joints thoroughly; remove loose and foreign matter that could impair adhesion or performance.

3.02 INSTALLATION

- A. Joint systems: Install in accordance with manufacturer's instructions and approved shop drawings.
- B. Align work plumb, level and flush with adjacent surfaces.
- C. Coordinate with work of other Sections.
- D. Remove joint seal from precompressed packaging, immediately insert into joint, and allow to expand.
- E. Use Temporary retainers if required to maintain joint seals in position until expansion is complete.
- F. Fire Rated Assemblies: Where required, install to manufacturer's instructions.

3.03 PROTECTION AND CLEANING

- A. Protect the completed Expansion Control system work from damage during construction. Damage protection includes surface abrasion and overloading of coverplate by materials handling equipment and construction waste/debris,
- B. Protection from environmental factors required throughout installation process until Project Closeout. Protection includes but is not limited to rain events, moisture protection, exposure to temperature fluctuations or direct sunlight for temperature sensitive product offerings.
- C. Prior to project closeout, clean all exposed surfaces with a suitable cleaner.

February 27, 2026

END OF SECTION

DIVISION 08- DOORS AND WINDOWS

SECTION 08110 - STEEL DOORS AND FRAMES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Standard steel frame products and doors assemblies including glazing, glazing stops and louvers as indicated and scheduled on drawings.
2. Behavioral Health steel frame products and assemblies including glazing and glazing stops as indicated and scheduled on the Drawings.

B. Related Work Described Elsewhere:

1. Finish hardware is specified in Section 08710 - FINISH HARDWARE.
2. Paint Finish is specified in Section 09900 – PAINTING.

1.02 DEFINITIONS

- A. Behavioral Health Assemblies: Steel frame assemblies located in areas that are accessible to the patients.

1.03 REFERENCES

A. American National Standards Institute (ANSI)

1. ANSI/NFPA 80, Standard for Fire Doors and Other Opening Protectives.
2. ANSI/UL 10C, Standard for Positive Pressure Fire Tests of Door Assemblies.

B. American Society of Testing and Materials (ASTM)

1. ASTM A 653, Specification for Steel Sheet, Zinc-Coated, (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
2. ASTM A 1008, Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability. Solution Hardened and Bake Hardenable.
3. ASTM A 1011, Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability and Ultra-High Strength.

C. Hollow Metal Manufacturer's Association (HMMA)

1. HMMA 805, Recommended Selection and Usage Guide for Hollow Metal Doors and Frames.
2. HMMA 810, Hollow Metal Doors
3. HMMA 820, Hollow Metal Frames

D. Steel Door Institute (SDI)

February 27, 2026

1. ANSI/SDI A250.8, Specifications for Standard Steel Doors and Frames
2. ANSI/SDI A250.10, Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
3. ANSI/SDI A250.11, Recommended Erection Instructions for Steel Frames.
4. SDI 117, Manufacturing Tolerances for Standard Steel Doors and Frames.

1.04 QUALITY ASSURANCE

- A. Provide doors and frames complying with ANSI/SDI 100 "Recommended Specifications for Standard Steel Doors and Frames", Hollow Metal Manufacturer's Association, HMMA and as herein specified.
- B. Manufacturer's Qualifications: Provide evidence of having personnel and plant equipment capable of fabricating hollow metal door and frame assemblies of the type specified herein.
- C. Fire-Rated Assemblies: Where fire-rated assemblies are indicated or required, provide fire-rated door assemblies that comply with NFPA 80 "Standard for Fire Doors and Fire Windows", and have been tested, listed, and labeled in accordance with UL 10C "Positive Pressure Fire Tests of Door Assemblies" and NFPA 252 "Fire Tests of Door Assemblies" by a nationally recognized independent testing and inspection agency acceptable to authorities having jurisdiction.
- D. Fire door assemblies in exit enclosures and exit passageways must have a maximum transmitted temperature end point of not more than 250°F (121°C) above ambient at the end of 30 minutes of the standard fire test exposure.
- E. Hardware Mounting Heights: The Contractor shall be responsible to coordinate all mounting heights of various finish hardware with all project requirements.

1.05 SUBMITTALS

- A. Submit under the provisions of Section 01330 – SUBMITTAL PROCEDURES.
- B. Manufacturer's Data: Submit manufacturer's technical product data substantiating that products comply with requirements.
- C. Shop Drawings: Submit for fabrication and installation of steel doors and frames. Include details of each frame type, conditions at openings, details of construction, location and installation requirements of finish hardware and reinforcements, and details of joints and connections, gauges, and finishes. Show anchorage and accessory items.
- D. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the work.
- E. Manufacturer's Qualifications.
- F. Schedule: Provide a schedule of doors and frames using same reference numbers for details and openings as those on contract drawings.
- G. Label Construction Certification: For assemblies required to be fire-rated and exceeding sizes of tested assemblies, submit manufacturer's certification for that each frame assembly has been constructed to conform to design, materials and construction equivalent to requirements for labeled construction.

- H. Contractor responsible for coordination and installation of products covered under this Section shall:
 - 1. Verify and submit to the manufacturer's the actual opening sizes and site conditions by field measurements before fabrication. Coordinate field measurements with fabrication and construction schedules to avoid delays.
 - 2. Verify that substrate conditions, whether existing or installed under other Sections, are as detailed in the Architect's drawings and are acceptable for product installation in accordance with the manufacturer's instructions.
- I. Reflect measurements and conditions determined under Section 1.04.G in submittal documents and manufacture product accordingly.
- J. Do not proceed with fabrication without receipt of approved submittal drawings and approved hardware schedules.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver hollow metal work cartoned or crated to provide protection during transit and job storage. Strap knock-down frames in bundles. Provide temporary steel spreaders securely fastened to the bottom of each welded frame.
- B. Inspect hollow metal work upon delivery for damage. Minor damages may be repaired provided refinished items are equal in all respects to new work and acceptable to the Architect; otherwise, remove and replace damaged items as directed.
- C. Store doors and frames at building site under cover in a dry, secure place. Place units on minimum 4-inch high wood blocking. Avoid use of non-vented plastic or canvas shelters which could create humidity chambers.

1.07 COORDINATION

- A. Coordinate Work with other directly affected sections involving manufacture or fabrication of internal cutouts and reinforcement for door hardware, electric devices and recessed items.
- B. Coordinate work with frame opening construction, door and hardware installation.
- C. Sequence installation to accommodate required door hardware.
- D. Hardware Mounting Heights: The Contractor shall be responsible to coordinate all mounting heights of various finish hardware with all project requirements.
- E. Verify field dimensions for factory assembled frames prior to fabrication.

1.08 WARRANTY

- A. Provide manufacturer's standard written warranty in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
 - 1. Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.
 - 2. Warranty Period: One (1) year from the date of Substantial Completion.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Galvanized Steel Sheets: Zinc coated commercial quality carbon steel, Type B; suitable for exposed applications, complying with ASTM A 1008. Protective zinc coating to comply with ASTM A 653 coating designation G90 at all doors and frames.
- B. Supports and Anchors: Fabricate of not less than 18-gauge galvanized sheet steel.
- C. Frame Anchors:
 - 1. Wall Anchors for Attachment to Drywall Partitions:
 - a. Use manufacturer's adjustable type compression anchors with knocked down die mitered frames at drywall locations.
 - b. Use stud anchors sized to accommodate frame jamb depth and face dimension on all welded frames.
 - 2. Compression Type for Drywall Slip-on Frames: Adjustable compression anchors.
 - 3. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.
 - 4. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
 - 5. Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - a. Compression Type: Not less than two anchors for each jamb.
 - b. Stud Wall Type: Provide three anchors per jamb up to 60-inches in height and four anchors for jambs 60 to 90 inches in height.
 - c. Masonry Type: Provide two anchors per jamb up to 60-inches in height and three anchors for jambs 60 to 90 inches in height.
 - 6. Floor Anchors: Angle clip type:
 - a. 16 gauge minimum.
 - 1) Same gauge as door frames for floor anchors used in Behavioral Health assemblies.
 - b. To receive 2 fasteners per anchor.
 - c. Welded to the bottom of each jamb.
 - 1) Weld floor anchors inside the jamb with at least 4 weld spots per anchor for floor anchors used in Behavioral Health assemblies.
- D. Inserts, Bolts and Fasteners: Manufacturer's standard units, except hot-dip galvanize, complying with ASTM A 153/A 153M "Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware", Class C or D as applicable.

February 27, 2026

- E. Factory Applied Primer Paint: Rust-inhibitive enamel paint, either air-drying or baking, suitable as a base for specified finish paints conforming to ANSI A250.10 "Test Procedures and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames". Primers shall be free from asbestos, lead, mercury, chromate, and cadmium.

2.02 MANUFACTURERS

- A. Standard Steel Door and Frame Manufacturers: Subject to compliance with requirements of this section, provide products from one of the following:
 - 1. Amweld Building Products, Inc.
 - 2. Ceco Door, Assa Abloy
 - 3. Curries Co.
 - 4. Steelcraft
 - 5. Or approved equal.

2.03 FABRICATION, GENERAL

- A. Fabricate doors and frames to meet the quality standards and fabrications methods established by the Steel Door Institute (SDI) and the Hollow Metal Manufacturer's Associations (HMMA) and in accordance with the Contract Documents and approved submittal drawings.
- B. Fabricate steel doors and frame units to be rigid, neat in appearance and free from defects, warp or buckle.
- C. Fabricate frames, concealed stiffeners, reinforcement, edge channels, and moldings from galvanized cold-rolled steel.
- D. Fabricate all doors and frames from galvanized sheet steel.
- E. Tolerances: Comply with SDI 117, "Manufacturing Tolerances for Standard Steel Doors and Frames."
- F. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat Phillips heads for exposed screws and bolts.
- G. Finish Hardware Preparation: Prepare doors and frames to receive mortised and concealed finish hardware in accordance with final Finish Hardware Schedule and templates provided by hardware supplier. Comply with applicable requirements of ANSI/SDI A250.6 series specifications for frame preparation for hardware.
 - 1. Reinforce standard doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied finish hardware may be done at project site. Provide minimum gauge hardware reinforcing for mortise or surface applied hardware as follows:
 - a. Standard Doors and Frames
 - 1) Mortised Hinges: 0.093-inch.
 - 2) Surface Closers: 0.067-inch.
 - b. Behavioral Health Assemblies

- 1) Hinges: 0.167-inch
 - 2) Closers: 0.167-inch
 - 3) Lock Front: 0.093-inch
2. Locate finish hardware as indicated on final shop drawings or, if not indicated, in accordance with DHI-05 "Recommended Locations for Builder's Hardware for Standard Steel Doors and Frames" and the 2010 ADA Standards for Accessible Design Section 404.2.7.

H. Factory Painting:

1. Clean, phosphatize, and prime paint exposed surfaces of steel doors and frame units, including galvanized surfaces.
2. Clean steel surfaces of mill scale, rust, oil, grease, dirt, and other foreign materials before application of paint.
3. Apply factory coat of prime paint to an even consistency to provide a uniformly finished surface ready to receive paint finish specified in Section 09900 – PAINTING.

2.04 STANDARD STEEL DOORS

A. Flush Steel Doors:

1. Provide doors complying with the requirements indicated below by referencing ANSI 250.8 for level and model and ANSI A250.4 for physical-endurance level:
 - a. Exterior Doors: Level 3 (16 gauge) and Physical Performance Level B (Heavy Duty), Model 2 (Seamless).
2. Construction, General:
 - a. Doors shall be of the types and sizes shown on approved shop drawings.
 - b. Door face sheets shall be joined at their vertical edges with no visible seams on their faces. Minimum door thickness shall be 1-3/4-inches.
 - c. Face sheets shall be stiffened by continuous vertical formed steel sections which, upon assembly span the full thickness of the interior space between the door faces. These stiffeners shall be not less than 22 gage, spaced so that the vertical interior webs shall be no more than 6" apart and securely fastened to both face sheets by spot welds spaced at a maximum of 5" o.c. vertically. Spaces between stiffeners shall be filled with fiberglass or mineral rockwool batt-type material.
 - d. Door faces shall be joined together at their vertical edges by a continuous weld extending the full height of the door. All such welds to be ground, filled and dressed smooth to make them invisible and provide a smooth flush surface.
 - e. Top and bottom edges of all doors shall be closed with continuous steel channels not less than 16 gage, spot welded to both faces.
 - f. Edge profiles shall be provided on both vertical edges of doors as follows:

- 1) Single-acting swing doors - beveled 1/8-inch in 2-inches.
3. Finish: As specified herein.

2.05 STANDARD STEEL FRAMES

- A. Provide metal frames for doors of type and style as shown on drawings and schedules. Conceal fastenings, unless otherwise indicated. Fabricate frames of minimum 16 gauge cold-rolled furniture steel.
 1. Fabricate frames with mitered corners in the following type construction:
 - a. Exterior Door Frames: Full Welded construction.
 - b. Interior Door Frames: Knock-down (mechanical interlock joint) construction with hairline seam.
 2. Form all frames of hot dip galvanized steel.
 3. Frames shall comply with ANSI A250.4 "Performance Test Procedures for Steel Door Frames and Frame Anchors", Level A, one million cycle swing test performance for a 4070-door frame.
 4. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
- B. Door Silencers: Except on weather-stripped frames, drill stops to receive 3 silencers on strike jambs of single-swing frames and 2 silencers on heads of double-swing frames.
- C. Plaster Guards: Provide 26-gauge steel plaster guards or mortar boxes, welded to frame, at back of finish hardware cutouts where mortar or other materials might obstruct hardware operation and to close off interior of openings.
- D. Template Hardware: Factory cut doors and frames for all template hardware including hinges, bolts, etc.
- E. Finish: As specified herein.

2.06 FRAMES IN BEHAVIORAL HEALTH ASSEMBLIES

- A. Provide metal frames for doors borrowed lites, transoms and windows of type and style as shown on drawings and schedules. Conceal fastenings, unless otherwise indicated. Fabricate frames of minimum 14 gauge (0.067-inch) reinforced galvanized steel.
 1. Fabricate frames with mitered corners in the following type construction:
 - a. Interior Borrowed Lite, Transom and Window Frames: Full Welded construction.
- B. Fabricate frames such that all finished work is neat in appearance, square, and free of defects, warps and buckles. Form pressed steel members such that they are straight and of uniform profile throughout their lengths.
- C. Fabricate frames so fasteners and or glazing stops are located on patient side of frame.
- D. Fabricate jamb, header and sill profiles in accordance with the frame schedule and as shown on the approved submittal drawings.

- E. Fabricate corner joints such that all of their contact edges are closed tight with faces mitered and stops either butted or mitered. Continuous weld faces and soft-fits and finish the faces smooth. The use of gussets or splice plates as a substitute for welding is not acceptable.
- F. Continuously weld all other face joints and finish them smooth.
- G. Provide continuous perimeter sealant using security sealant specified in Section 07920 – SEALANTS at patient side to create flush, ligature-resistant condition.
- H. Minimum height of stops in door openings are required to be 0.625 in. Height of stops on security glazing openings are required to be as shown on approved submittal drawings.
- I. Floor Anchors
 - 1. Where applicable, provide floor anchors with two (2) holes for fasteners and fasten them inside jambs with at least four (4) spot welds per anchor.
 - 2. Where so scheduled, install adjustable floor anchors, that provide not less than 2 -inches height adjustment, and fasten them in place with at least four (4) spot welds per anchor.
 - 3. Fabricate floor anchors of the same material thickness as frame.
- J. Jamb Anchors
 - 1. Provide the number of anchors on each jamb as follows:
 - a. Borrowed light and Window frames: 2 anchors plus 1 for each 18-inches or fraction thereof over 36-inches, spaced at 18-inches maximum between anchors.
 - 2. Door frames: 2 anchors plus 1 for each 18-inches or fraction thereof over 54-inches, spaced at 18-inches maximum between anchors.
- K. Glazing Stops:
 - 1. Where security glazing is scheduled or specified, provide pressed steel angle removable glazing stops of not less than 0.123-inch material thickness. Fabricate angle stops such that they are mitered or butted and tight fitting at the corner joints; and are secured in place using 1/4 – 20 or 1/4 – 28 button head tamper resistant, corrosion-resistant machine screws spaced not less than 2-inch from the ends and 9-inches o.c.
 - a. Where applicable don't locate removable stops on the patient side.
 - 2. Stops in borrowed lite, transom and window frames shall have a height to provide 1-inch security glazing engagement. Stops shall be sized and located to accept 1/2-inch-thick glazing.
- L. Glazing: 1/2-inch-thick clear polycarbonate glazing with UV and abrasions resistant coating.
 - 1. Impact Resistant; suitable for high-abuse and behavioral healthcare environments.
 - 2. Flame spread characteristics complying with ASTM E84 requirements for interior finish where applicable.
 - 3. Acceptable Manufacturer's:

February 27, 2026

- a. AZ Polymers, LLC; AZCARB AR 15 Polycarbonate Glazing
 - b. Plaskolite, LLC; Tuffak 15 Polycarbonate Glazing
 - c. Polyvantis, LLC, SL4855 Polycarbonate Glazing.
4. Provide setting blocks and continuous glazing tape per glazing manufacturer's recommendations.

2.07 FIRE-RATED ASSEMBLIES

- A. Assemblies shall bear the listing identification label of the Underwriters Laboratories, Inc. (UL), Factory Mutual Engineering Corp. (FM), Warnock Hersey International (WHI), or a nationally recognized testing laboratory qualified to perform tests of fire assemblies in accordance with ANSI/UL 10C and NFPA 252 and having a listing for the tested assemblies. Listing identification labels shall be constructed and permanently applied by a method which results in their destruction should they be removed. Labels shall be metal with raised letters and shall bear the name and file number of the frame manufacturer. Labels shall not be painted.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces. Touch up factory-applied finishes where spreaders are removed.
- B. Drill and tap doors and frames to receive non-templated, mortised, and surface-mounted door hardware.

3.03 INSTALLATION, DOORS

- A. General: Install steel doors and frames in accordance with final shop drawings, manufacturer's data, and as herein specified.
- B. Placing Frames: Comply with provisions of SDI-105 "Recommended Erection Instructions for Steel Frames", unless otherwise indicated.
 1. Anchors: Provide sufficient anchorage to attach to wall in accordance with ANSI A250.4 Test compliance Level A of one million cycles, or anchorage as detailed on drawings to specific wall conditions.
 2. Except for frames located at in-place concrete and masonry installations, place frames prior to construction of enclosing walls and ceilings. Set frames accurately in position, plumbed, aligned, and braced securely until

permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders leaving surfaces smooth and undamaged.

3. Install fire-rated frames in accordance with NFPA 80.
 4. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
 5. Glazing: Comply with installation requirements in Section 08800 - GLAZING and with hollow metal door and frame manufacturer's written instructions
- C. Door Installation: Fit hollow-metal accurately in frames, with clearances specified in ANSI/SDI 100.
1. Fire-Rated Doors: Install doors with clearances according to NFPA 80.

3.04 TOLERANCES

- A. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
1. Squareness: Plus, or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 2. Alignment: Plus, or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
 3. Twist: Plus, or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 4. Plumbness: Plus, or minus 1/16 inch, measured at jambs at floor.

3.05 ADJUST AND CLEAN

- A. Factory Coat Touch-up: Immediately after erection, sand smooth any rusted or damaged areas of factory coating and apply touch-up of matching air-drying coating.
- B. Final Adjustments: Check and readjust operating finish hardware items, leaving steel frames undamaged and in complete and proper operating conditions.

END OF SECTION

SECTION 08210 - WOOD DOORS

PART 1 - GENERAL

1.01 SUMMARY

- A. Types of doors required include flush wood doors.
 - 1. Interior Non-rated doors.
- B. Related Work Described Elsewhere:
 - 1. Steel door frame as specified in Section 08110 – STEEL DOORS AND FRAMES.
 - 2. Door Hardware as specified in Section 08710 – FINISH HARDWARE.

1.02 SUBMITTALS

- A. Submit under the provisions of Section 01330 – SUBMITTAL PROCEDURES.
- B. Manufacturer's Data: Door manufacturer's technical data for each type of door, including details of core and edge construction.
- C. Shop Drawings: Submit shop drawings indicating location and size of each door, door swing, dimensions, veneers, elevation of each kind of door, details of construction, location and extent of hardware blocking, fire ratings, and other pertinent data.
- D. Samples:
 - 1. Sample for Verification: Submit three 12" x 12" verification corner samples of each different type of door, wood species and finish for approval.

1.03 QUALITY ASSURANCE

- A. Quality Standards: Comply with the following standards:
 - 1. WDMA Quality Standard:
 - a. Flush Wood Doors: WDMA I.S.-1A "Wood Flush Doors"
 - 2. AWS Quality Standards: "Architectural Woodwork Standards", including Section 4 "Sheet Products", Section 9, "Door" of Architectural Woodwork Standards (AWS) for grade of door, core construction, finish and other requirements exceeding those of WDMA quality standard
- B. WDMA Quality Marking: Mark each wood door with WDMA Wood Door Certification Hallmark certifying compliance with applicable requirements of WDMA I.S.-1A and WDMA I.S.-6A. For manufacturers not participating in WDMA Hallmark Program, a certification of compliance may be substituted for marking of individual doors.
- C. Safety Glazing Standard: 16 CFR 1201 for heat treated and laminated glass, permanently marked with Safety Glazing Certification Council label. Comply with applicable codes.
 - 1. Glazing lites more than 9 sq. ft. in exposed surface area of one side, provide glazing products that comply with Category II materials, for lites 9 sq. ft. or

less in exposed surface area of one side, provide glazing products that comply with Category I or II materials, except for hazardous locations where Category II materials are required by 16 CFR 1201 and regulations of authorities having jurisdiction

- D. Factory seal all doors on all 6 sides using manufacturer's standard sealer.
- E. Manufacturer: Obtain from a single manufacturer for each type of wood door or all doors for one manufacturer.
- F. Hardware Mounting Heights and Clearances: The Contractor shall be responsible to coordinate all mounting heights of various finish hardware with all project requirements and door clearances required for scheduled hardware of each door.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Protect doors during transit, storage and handling to prevent damage, soiling and deterioration. Comply with requirements of referenced standards and recommendations of WDMA I.S.-1A Section J-1 "Job Site Information", and WDMA 1.S 6A.
- B. Identify each door with individual opening numbers which correlate with designation system used on shop drawings for door, frames, and hardware, using temporary, removable or concealed markings.
- C. Do not walk on or stack other materials on top of stacked doors. Do not drag doors across one another.
- D. For all doors not factory finished, seal all four edges immediately after delivery.
- E. Store doors away from threat of termite or other insect infestation.

1.05 PROJECT CONDITIONS

Conditioning: Do not deliver or install doors until conditions for temperature and relative humidity have been stabilized and will be maintained in storage and installation areas during remainder of construction period to comply with the following requirements applicable to project's geographical location: AWS Section 2 paragraph 1.2.3, "Relative Humidity and Moisture Content."

1.06 COORDINATION

- A. Coordinate installation requirements and templates for door hardware scheduled for doors on the Drawings and specified in Section 08710 – FINISH HARDWARE.
- B. Coordinate door hardware locations in wood doors with steel frames in Section 08110 – STEEL DOORS AND FRAMES where wood doors are scheduled to be installed in standard steel frames.
- C. Coordinate and field verify rough openings, steel frame size with wood door size prior to fabrication to ensure door fits within framed opening in accordance to the specified clearances and can operate freely with out binding.

February 27, 2026

1.07 DELIVERY, STORAGE, AND HANDLING

A. Delivery:

1. Deliver doors to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
2. Package doors individually in polybags.

B. Storage:

1. Store doors in accordance with manufacturer's instructions.
2. Store doors in clean, dry area indoors, protected from damage and direct sunlight.
3. Store doors flat on level surface.
4. Do not store doors directly on concrete.
5. Keep doors completely covered. Use covering which allows air circulation and does not permit light to penetrate.
6. Store doors between 50 and 90 degrees F (10 and 32 degrees C) and 30 to 50 percent relative humidity.

C. Handling:

1. Handle doors in accordance with manufacturer's instructions.
2. Protect doors and finish during handling and installation to prevent damage.
3. Handle doors with clean hands or clean gloves.
4. Lift and carry doors. Do not drag doors across other doors or surfaces

1.08 WARRANTY

A. General: Warranties shall be in addition to, and not a limitation of, other rights the Owner may have under the Contract Documents.

B. Door Manufacturer's Warranty: Submit written agreement on door manufacturer's standard form signed by Manufacturer, Installer and Contractor, agreeing to repair or replace defective doors which have warped (bow, cup or twist) or that show telegraphing of core construction in face veneers, or do not conform to tolerance limitations of referenced quality standards.

1. Warranty shall be in effect during following minimum period of time after date of Substantial Completion, unless longer warranty is standard with the manufacturer.
2. Flush Interior Doors: Lifetime

C. Contractor's Responsibilities: Replace or refinish doors where Contractor's work contributed to rejection or to voiding of manufacturer's warranty.

PART 2 - PRODUCTS

2.01 INTERIOR WOOD FLUSH DOORS

A. Basis-of-Design: The flush wood doors products indicated in this section and on the drawings are products manufactured by VT Industries, Inc. Subject to

February 27, 2026

compliance with requirements and Architect's approval, products from the following manufacturers may be substituted:

1. Forte Opening Solutions
 2. Simpson Door Company
 3. Lynden Doors, Inc.
- B. Performance Grade: ANSI/WDMA I.S.1A Heavy Duty
- C. ANSI/WDMA I.S.1A Quality Grade: Custom.
- D. Flush Doors: Comply with the following requirements:
1. Core: Structural composite lumber core
 2. Construction: Five plies with stiles and rails bonded to core, then entire unit abrasive planed before veneering.
 3. Faces:
 - a. Faces: Veneer indicated on the drawings.
 - b. Stiles: Applied wood-veneer edges of same as interior faces and covering edges of faces.
 - c. Veneer Matching: Book Matched
 - 1) Veneer grain direction: vertical
 4. Glass Lites: Where scheduled or indicated provide, Kind FT (Fully Tempered), Condition A, Type 1, Class 1, Quality q3, 1/4-inch thick unless indicated or required otherwise complying with testing requirements in 16 CFR 1201 for Category II materials.
 - a. Size: As indicated on the Drawings
 - b. Wood Beads for Light Openings: Provide manufacturer's standard wood beads unless otherwise indicated.
 - 1) Wood Species: Same species as door faces.
 - 2) Profile: Flush rectangular beads
 5. Finish: As indicated on the Drawings.

2.02 FABRICATION

- A. Wood Doors: Fabricate wood doors to produce doors in sizes indicated for job-site fitting.
- B. Openings in Flush Doors: Cut and trim openings through doors in factory.
- C. Glazing: Factory install glazing in doors indicated to be factory finished.
- D. Adhesives: Adhesives shall be in accordance with WDMA I.S.-1A, requirements for Type I Bond Doors (waterproof) for all doors. Adhesives shall contain no formaldehydes.
- E. Finish Hardware: Locate hardware to comply with DHI-WDHS-3 and each door that is an element of an accessible route shall comply with Americans with Disabilities Act and Architectural Barriers Act Accessibility Guidelines (ADA-ABA)

February 27, 2026

Section 404.2.7. Comply with finish hardware schedules, doorframe shop drawings, DHI A115-W series standards, and hardware templates.

2.03 PRESERVATIVE TREATMENT

- A. Treat all solid core doors at factory with water repellent after manufacturing has been completed, in accordance with WDMA Industry Standard I.S.-4 "Water-Repellent Preservative non-Pressure Treatment for Millwork".

2.04 WOOD DOOR FINISH

- A. General: The entire finish of wood doors is work of this section, regardless of whether shop-applied or applied after installation.
 - 1. Shop finishing: To the greatest extent possible, finish wood doors at factory or shop. Defer only final touch-up, cleaning and polishing for time after delivery and installation.
- B. Finish: Manufacturer's standard interior finish with performance requirements comparable to WDMA TR-8 UV Cured Acrylated Polyester Urethane topcoat.
 - 1. Stain Color: Custom stain to match Wilsonart HPDL indicated on the Door Schedule.
 - 2. Topcoat Finish: Clear.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine installed door frames prior to hanging door:
 - 1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with plumb jambs and level heads.
 - 2. Reject doors with defects that cannot be repaired in a manner that is imperceptible. Replace doors which cannot be field repaired to match new as approved by the Architect at no additional cost to the Owner. Doors warped in excess of 1/4 inch when measured in accordance with WDMA I.S.-1A and WDMA I.S. 6A shall be rejected.
- B. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Hardware: For installation see Section 08710 - FINISH HARDWARE.
- B. Manufacturers' Instructions:
 - 1. Install wood doors to comply with manufacturer's instructions and of referenced WDMA standards and as indicated.
- C. Job Fit Doors: Align and fit doors in frame with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by

February 27, 2026

manufacturer or permitted. Machine doors for hardware. Seal cut surfaces after fitting and machining.

1. Fitting Clearances for Non-Rated Doors: Provide 1/8 inch at jambs and heads; and 1/2 inch from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 3/8-inch clearance from bottom of door to top of threshold unless indicated for undercut.
2. Bevel non-rated doors 1/8 inch in 2 inches at lock and hinge edges.

3.03 ADJUSTING AND PROTECTION

- A. Operation: Rehang or replace doors which are hinge bound and do not swing or operate freely. Replace or rehang doors which are warped, twisted, or which are not in true planes.
- B. Repair damaged doors per manufacturer's instructions and guidelines. Doors that cannot be repaired to the manufacturer's standards of quality shall be replaced at no additional expense to the Owner.
- C. Protection: Protect doors as recommended by door manufacturer to assure that wood doors will be without damage or deterioration at time of Substantial Completion

END OF SECTION

SECTION 08305 - ACCESS DOORS

PART 1 - GENERAL

1.01 SUMMARY

Section Includes: Provide access doors for walls and ceilings as shown or required by drawings as specified herein. Sizes of each type of access door required are as specified herein. Mechanical and electrical contractors shall furnish locations and numbers of required access doors to General Contractor.

1.02 SUBMITTALS

- A. Submit under the provisions of Section 01330 – SUBMITTAL PROCEDURES.
- B. Manufacturer's Data: Submit manufacturer's technical data and installation instructions for each type of access door assembly, including setting drawings, templates, instructions and directions for installation of anchorage devices. Include complete schedule, including types, general locations, sizes, wall and ceiling construction details, finishes, latching or locking provisions, and other data pertinent to installation.
- C. Verification: Obtain specific locations and sizes for required access doors from trades requiring access to concealed equipment and indicate on submittal schedule.

1.03 QUALITY ASSURANCE

- A. Size Variations: Obtain the Architect's acceptance of manufacturer's standard size units which may vary slightly from sizes indicated.
- B. Coordination: Furnish inserts and anchoring devices which must be built into other work for installation of access doors. Coordinate delivery with other work to avoid delay.
- C. Fire Rated Assemblies: Fire rated assemblies shall comply with NFPA 80, "Standard for Fire Doors and Fire Windows" and labeled by Underwriters Laboratories, Intertek/Warnock Hersey or other testing facility acceptable to the authorities having jurisdiction.

PART 2 - PRODUCTS

2.01 STEEL MATERIALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
 - 1. ASTM A 123, for galvanizing steel and iron products.
 - 2. ASTM A 153, for galvanizing steel and iron hardware.
- B. Metallic-Coated Steel Sheet: ASTM A 653, Commercial Steel (CS) with A60 zinc-iron-alloy (galvannealed) coating or G60 mill-phosphatized zinc coating; stretcher-leveled standard of flatness; with minimum thickness indicated representing specified thickness according to ASTM A 924.

- C. Steel Finishes: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
 - 1. Surface Preparation for Metallic-Coated Steel Sheet: Clean surfaces with non-petroleum solvent so surfaces are free of oil and other contaminants. After cleaning, apply a conversion coating suited to the organic coating to be applied over it. Clean welds, mechanical connections, and abraded areas, and apply galvanizing repair paint specified below to comply with ASTM A 780.
 - a. Galvanizing Repair Paint: High-zinc-dust-content paint for re-galvanizing welds in steel, complying with SSPC-Paint 20
 - 2. Factory-Primed Finish: Apply shop primer immediately after cleaning and pre-treating.
- D. Drywall Beads: Edge trim formed from 0.0299-inch zinc-coated steel sheet formed to receive joint compound and in size to suit thickness of gypsum board.

2.02 STEEL FLUSH PANEL DOORS FOR WALLS AND CEILINGS

- A. Flush Access Doors and Frames with Exposed Trim: Fabricated from metallic-coated steel sheet with the exception of wet areas where they are to be fabricated from stainless-steel sheet.
 - 1. For use in wall and ceiling surfaces as indicated at all back of house areas and concealed areas of public spaces.
 - 2. Door: Minimum 16-gauge sheet metal, set flush with exposed face flange of frame.
 - 3. Frame: Minimum 16-gauge sheet metal with 1-inch wide, surface-mounted trim.
 - 4. Hinges: Concealed continuous hinge
 - 5. Latch: Cam latch operated by spanner head wrench with interior release.
- B. For Gypsum Board Non-Rated Installation:
 - 1. Acudor; Model DW-5040.
 - 2. Milcor Style DW.
 - 3. J.L. Industries Model WB.
- C. For Gypsum Board Fire Rated (Uninsulated)
 - 1. Acudor; Model FB-5060.
 - 2. Milcor Style UFR.
 - 3. J.L. Industries Model FDWB.

2.03 STEEL RECESSED PANEL DOORS

- A. Recessed Access Doors and Trimless Frames: Fabricated from metallic-coated steel sheet.
 - 1. Locations: Wall surfaces in expose-to-view areas of where indicated on the drawings.

February 27, 2026

2. Door: Minimum 18-gauge sheet metal in the form of a pan recessed 5/8 inch or 1-inch for gypsum board infill or tile backer board where tile finishes occur, respectively.
 3. Frame: Minimum 16-gauge sheet metal with drywall bead for gypsum board surfaces.
 4. Hinges: Concealed continuous hinge.
 5. Latch: Cam latch operated by spanner head wrench with interior release.
- B. For Non-Rated Installation:
1. Acudor; Model DW-5015
 2. J.L.Industries Model CT
 3. Karp Associates, Inc. Model DSC210
- C. Recessed Panel Doors Sizes:
1. As indicated on the Drawings

2.04 FABRICATION

- A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.
- B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.
- C. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access panels to types of supports indicated.
1. Provide mounting holes in frames for attachment of units to metal framing.
 2. Provide mounting holes in frame for attachment of masonry anchors. Furnish adjustable metal masonry anchors.
- D. Latching Mechanisms: Furnish number required to hold doors in flush, smooth plane when closed.
1. For recessed panel doors, provide access sleeves for each locking device. Furnish plastic grommets and install in holes cut through finish.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Comply with manufacturer's instructions for installation of access doors.
- B. Coordinate installation with work of other trades.
- C. Set frames accurately in position and securely attach to supports with face panels plumb or level in relation to adjacent finish surfaces.

February 27, 2026

3.02 ADJUST AND CLEAN

- A. Adjust hardware and panels after installation for proper operation.
- B. Remove and replace panels or frames which are warped, bowed or otherwise damaged.

END OF SECTION

SECTION 08330 – OVERHEAD COILING DOORS

PART 1 - GENERAL

1.01 SUMMARY

- A. Work Includes:
 - 1. Electric motor operated, overhead coiling door.
 - a. Non-rated Doors
- B. Related Work Described Elsewhere:
 - 1. Section 06100 – ROUGH CARPENTRY
 - 2. Section 08710 – FINISH HARDWARE
 - 3. Section 09900 – PAINTING
 - 4. Division 16 - ELECTRICAL

1.02 PERFORMANCE REQUIREMENTS.

- A. Operation-Cycle Requirements: Provide overhead coiling door components and operators capable of operating for not less than 10,000 cycles.
 - 1. Include tamperproof cycle counter.
- B. Seismic Loads: Overhead coiling doors shall withstand the seismic loads, the effects of gravity loads, and loads and stresses within limits and under conditions indicated according to ASCE 7.

1.03 SUBMITTALS

- A. Submit under provisions of Section 01330 – SUBMITTAL PROCEDURES.
- B. Product Data: For each type and size of overhead coiling door submit manufacturer's technical product data, roughing-in diagrams, and installation instructions. Include description of fire-release system including testing and resetting instructions.
- C. Shop Drawings: For special components and installations not dimensioned or detailed in manufacturer's product data.
- D. Samples: Submit samples of manufacturer's finishes and color charts showing full range of colors available for selection by the Architect.
- E. Operations and Maintenance Manuals: Submit manufacturer's operation and maintenance manuals for each overhead coiling counter door.

1.04 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced installer who is a manufacturer's authorized representative who is trained and approved for both installation and maintenance of units required for this Project.
- B. Furnish each coiling service door as a complete unit produced by one manufacturer, including hardware, accessories, mounting and installation components, for installation to type of structural substrate and wall finish

February 27, 2026

conditions as indicated from a manufacturer registered with ISO 9001:2015 and a minimum of 5 years successful experience producing doors of the type specified.

- C. Source Limitations: Obtain overhead coiling doors through one source from a single manufacturer.
- D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100.

1.05 DELIVERY & STORAGE

- A. Protect door and accessories from damage during delivery, storage, and handling. Clearly mark manufacturer's brand name. Store in dry locations with adequate ventilation, free from dust and water, and in such a manner as to permit access for inspection and handling. Remove damaged items that cannot be restored to like new condition and provide new items.

1.06 WARRANTY

- A. Provide a 2-year written warranty against defects in workmanship and materials.
- B. Maintenance: Submit for Owner's consideration and acceptance of a maintenance service agreement for installed products.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Non-Rated Counter Doors: Products scheduled in the Drawings are based on Exam Room Configured Counter Door ESC15 as manufactured by Cornell Cookson, LLC.
- B. Subject to the compliance of the requirements of the section and Architect's approval, products of the following manufacturers may be substituted:
 - 1. Cornell Iron Works
 - 2. Overhead Door Company
 - 3. Raynor
 - 4. Or approved equal.

2.02 DOOR CURTAIN MATERIALS AND CONSTRUCTION

- A. Door Curtains: Fabricate overhead coiling door curtain of interlocking slats, designed to withstand loading indicated, in a continuous length for width of door without splices. Unless otherwise indicated, provide slats of thickness and mechanical properties recommended by door manufacturer for performance, size, and type of door indicated, and as follows:
 - 1. Steel Service Door Curtain Slats: 22-gauge Zinc-coated (galvanized), cold-rolled structural steel (SS) sheet; complying with ASTM A 653/A 653M, G90 (Z275) coating designation, Commercial Quality.

- a. Flat profile slats, 1-1/2-inch high by 1-1/2-inch deep, minimum.
- B. Endlocks for Service Doors: High-strength galvanized steel or malleable-iron casings galvanized after fabrication, secured to curtain slats with galvanized rivets or high-strength nylon. Provide locks on not less than alternate curtain slats for curtain alignment and resistance against lateral movement.
- C. Bottom Bar for Service Doors: Consisting of 2 angles, each not less than 2 by 2 by 1/8-inch-thick; galvanized to suit type of curtain slats.
- D. Curtain Jamb Guides for Service Doors: Fabricate curtain jamb guides from steel channels and angles, with sufficient depth and strength to retain curtain, to allow curtain to operate smoothly, and to withstand loading. Slot bolt holes for guide adjustment. Provide removable stops on guides to prevent overtravel of curtain, and a continuous bar for holding windlocks.

2.03 HOODS AND ACCESSORIES

- A. Service Door:
 - 1. Hood: Form to entirely enclose coiled curtain and operating mechanism at opening head. Contour to fit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Provide closed ends for surface-mounted hoods and provide fascia for any portion of between-jamb mounting projecting beyond wall face. Provide intermediate support brackets as required to prevent sagging. Fabricate hood of not less than 24 gauge hot-dip galvanized steel sheet with G90 zinc coating, complying with ASTM A653/A 653M. Phosphate treat before fabrication.
 - 2. Locking Mechanisms:
 - a. Slide Bolt: Fabricate with side-locking bolts to engage through slots in tracks for locking by padlock, located on both left and right jamb sides, operable from coil side
 - 3. If door unit is power operated, provide safety interlock switch to disengage power supply when door is locked.

2.04 COUNTERBALANCING MECHANISM

- A. General: Counterbalance doors by means of adjustable-tension, steel helical torsion spring mounted around a steel shaft and contained in a spring barrel connected to door curtain with barrel rings. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.
- B. Provide spring balance of one or more oil-tempered, heat-treated steel helical torsion springs. Size springs to counterbalance weight of curtain, with uniform adjustment accessible from outside barrel. Provide cast-steel barrel plugs to secure ends of springs to barrel and shaft.
- C. Fabricate torsion rod for counterbalance shaft of cold-rolled steel, sized to hold fixed spring ends and carry torsional load.
- D. Brackets: Provide mounting brackets of manufacturer's standard design, either cast iron or cold-rolled steel plate.

2.05 ELECTRIC DOOR OPERATORS

- A. General: Provide electric door operator assembly of size and capacity recommended and provided by door manufacturer for door and operation-cycle requirements specified, with electric motor and factory-prewired motor controls, starter, gear-reduction unit, solenoid-operated brake, clutch, remote-control stations, control devices, integral gearing for locking door, and accessories required for proper operation.
- B. Comply with NFPA 70.
- C. Disconnect Device: Provide hand-operated disconnect or mechanism for automatically engaging chain and sprocket operator and releasing brake for emergency manual operation while disconnecting motor without affecting timing of limit switch. Mount disconnect and operator so they are accessible from floor level. Include interlock device to automatically prevent motor from operating when emergency operator is engaged.
- D. Design operator so motor may be removed without disturbing limit-switch adjustment and without affecting emergency auxiliary operator.
- E. Provide control equipment complying with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6, with NFPA 70 Class 2 control circuit, maximum 24-V, ac or dc.
- F. Door-Operator Type: Provide bracket-mounted, jackshaft-type door operator unit consisting of electric motor, belt-driven, gear reduction, and chain and sprocket secondary drive.
- G. Electric Motors: Provide high-starting torque, reversible, continuous-duty, Class A insulated, electric motors complying with NEMA MG 1; with overload protection; sized to start, accelerate, and operate door in either direction from any position, at 2/3 fps, without exceeding nameplate ratings or service factor.
 - 1. Service Factor: According to NEMA MG 1, unless otherwise indicated.
 - 2. Coordinate wiring requirements and electrical characteristics of motors with building electrical system.
 - 3. Provide open dripproof-type motor, and controller with NEMA ICS 6, Type 1 enclosure.
- H. Remote-Control Station: Provide momentary-contact, three-button control station with push-button controls labeled "Open," "Close," and "Stop."
 - 1. Provide interior units, full-guarded, surface-mounted, heavy-duty type, with general-purpose NEMA ICS 6, Type 1 enclosure.
- I. Obstruction Detection Device: Provide each motorized door with indicated external automatic safety sensor capable of protecting full width of door opening. Activation of sensor immediately stops and reverses downward door travel.
 - 1. Sensor Seal Edge: Provide each motorized door with an automatic safety sensor edge, located within astragal stripping mounted to bottom bar. Contact with sensor immediately stops and reverses downward door travel. Connect to control circuit using manufacturer's standard take-up reel or self-coiling cable.
 - a. Provide manufacturer's standard actuated automatic bottom bar.

February 27, 2026

- J. Limit Switches: Provide adjustable switches, interlocked with motor controls and set to automatically stop door at fully opened and fully closed positions.
- K. Emergency Manual Operation: Equip each electrically powered door with capability for emergency manual operation using Chain-Hoist Operator operated from the inside.
 - 1. Chain-Hoist Operator: Consisting of endless steel hand chain, chain-pocket wheel and guard, and gear-reduction unit with a maximum 25 lbf force for door operation. Provide alloy-steel hand chain with chain holder secured to operator guide.

2.06 FINISHES

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- C. Service Door Finish:
 - 1. Door shall be provided with manufacturer's bonderized preparation, prime, and powder coat finish, color to be selected by Architect. Shop clean and prime ferrous metal and galvanized guide surfaces, exposed and unexposed, except faying and lubricated surfaces, with rust inhibitive primer compatible with finish coats specified.
 - a. Colors: As selected by the Architect

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates upon which work will be installed and verify conditions are in accordance with final approved shop drawings.
- B. Report any unsatisfactory conditions and substrates to the General Contractor and coordinate corrective work to substrate.
- C. Commencement of work by installer is acceptance of substrate.

3.02 INSTALLATION

- A. General: Install coiling doors and operating equipment complete with necessary hardware, jamb and head molding strips, anchors, inserts, hangers, and equipment supports in accordance with final approved shop drawings, manufacturer's instructions, and as specified herein. Install door assembly to meet or exceed specified performance requirements.
- B. Upon completion of installation including work by other trades, lubricate bearings and sliding parts; adjust doors to operate easily, free of warp, twist, or distortion and with weathertight fit around entire perimeter.

February 27, 2026

- C. Touch-up all scuffs and abrasions of the finish coat with suitable primer and matching finish as recommended by the manufacturer.

3.03 DEMONSTRATION

- A. Demonstrate and instruct proper operation, maintenance, and repair of system components to School's maintenance personnel.

END OF SECTION

SECTION 08340 – BEHAVIORAL HEALTH DOORS AND FRAMES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. All labor, materials, equipment, and services necessary to complete the special function doors as shown on the drawings and/or specified herein, including, but not necessarily limited to, the following:
 - a. Anti-Barricade Ligature resistant door assemblies.

B. Related Work Described Elsewhere:

1. Section 08110 – STEEL DOORS AND FRAMES
2. Section 08710 - FINISH HARDWARE.
3. Section 09900 - PAINTING.

1.02 REFERENCES

A. American National Standards Institute (ANSI)

1. ANSI/SDI A250.8, Specifications for Standard Steel Doors and Frames
2. ANSI/SDI A250.10, Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
3. ANSI/SDI A250.11, Recommended Erection Instructions for Steel Frames.

B. American Society of Testing and Materials (ASTM)

1. ASTM A 653, Specification for Steel Sheet, Zinc-Coated, (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
2. ASTM A 1008, Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability. Solution Hardened and Bake Hardenable.
3. ASTM A 1011, Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability and Ultra-High Strength.

1.03 QUALITY ASSURANCE

A. Manufacturer's Qualifications:

1. Provide evidence of having personnel and plant equipment capable of fabricating specialty door and frame products of the types specified.
2. Provide evidence of having a written quality control system in place.

B. Provide assembly compliant to UL-1784 Standard for Air Leakage Tests of Door Assemblies and Other Opening Protectives.

C. Doors to be pre-assembled with all hardware prior to arriving onsite.

1.04 SUBMITTALS

- A. Submit under the provisions of Section 01330 – SUBMITTAL PROCEDURES.
- B. Manufacturer's Data: Submit manufacturer's technical product data specifications, cut sheets and other data needed to prove compliance with the specified requirements.
 - 1. Materials list of items proposed to be provided under this Section.
- C. Shop Drawings: Submit for fabrication and installation of Behavioral Health doors and frames. Include details of each frame type, conditions at openings, details of construction, location and installation requirements of finish hardware and reinforcements, and details of joints and connections, gauges, and finishes. Show anchorage and accessory items.
- D. Samples for Verification:
 - 1. Submit 3 sets of manufacturer's standard samples of powdercoat finish indicated on drawings.
 - 2. Submit 3 sets of manufacturer's veneer as indicated on the drawings.
- E. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the work.
- F. Schedule: Provide a schedule of doors and frames using same reference numbers for details and openings as those on contract drawings.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver hollow metal work cartoned or crated to provide protection during transit and job storage. Strap knock-down frames in bundles. Provide temporary steel spreaders securely fastened to the bottom of each welded frame.
- B. Inspect hollow metal work upon delivery for damage. Minor damages may be repaired provided refinished items are equal in all respects to new work and acceptable to the Architect; otherwise, remove and replace damaged items as directed.
- C. Store doors and frames at building site under cover in a dry, secure place. Place units on minimum 4-inch high wood blocking. Avoid use of non-vented plastic or canvas shelters which could create humidity chambers.

1.06 COORDINATION

- A. Coordinate Work with other directly affected sections involving manufacture or fabrication of internal cutouts and reinforcement for door hardware, electric devices and recessed items.
- B. Coordinate work with frame opening construction, door and hardware installation.
- C. Sequence installation to accommodate required door hardware.
- D. Coordination: Provide door manufacturer the hardware scheduled in Section 08710 – FINISH HARDWARE but not supplied by the door manufacturer and their templates to enable their installation prior to arriving onsite.

February 27, 2026

- E. Contractor responsible for coordination and installation of products covered under this Section shall:
 - 1. Verify and provide to the manufacturer, actual opening sizes and site conditions by field measurements before fabrication. Coordinate field measurements with fabrication and construction schedules to avoid delays.
 - 2. Verify that substrate conditions, whether existing or installed under other Sections, are as detailed in the Architect's drawings and are acceptable for product installation in accordance with the manufacturer's instructions.

1.07 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect the materials of this Section before, during, and after installation, and to protect the installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary.

1.08 WARRANTY

- A. Provide manufacturer's standard written warranty in which manufacturer agrees to repair or replace door assembly that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: One (1) year from the date of Substantial Completion.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Galvanized Steel Sheets: Zinc coated commercial quality carbon steel, Type B; suitable for exposed applications, complying with ASTM A 1008.. Comply with ASTM A 653 coating designation A60 for doors and frames.
- B. Inserts, Bolts and Fasteners: Manufacturer's standard units, except hot-dip galvanize, complying with ASTM A 153/A 153M "Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware", Class C or D as applicable.
- C. Factory Applied Primer Paint: Rust-inhibitive enamel paint, either air-drying or baking, suitable as a base for specified finish paints conforming to ANSI A250.10 "Test Procedures and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames". Primers shall be free from asbestos, lead, mercury, chromate, and cadmium.
- D. Architectural Film for door finish: Vinyl 8 mil thickness (thickness includes film and adhesive, excludes liner).
 - 1. Liner: Silicone-coated poly paper, 6.2 mils
 - 2. Adhesive: Pressure-sensitive with air release channels, recommended by manufacturer.

2.02 MANUFACTURERS

- A. Behavioral Health Door and Frame Manufacturers (Basis-of-Design): Subject to compliance with requirements of this section, provide doorsets from Kingsway Group, Inc.

2.03 BEHAVIORAL HEALTH DOORSETS

- A. Anti-Barricade Ligature-Resistant Doorset (**Door Type F**): SWING Anti-Barricade Doorset.

1. Complete doorset delivered in three sections: door assembly, frame assembly, and emergency stop assembly. Additional hardware provided separately with assembly.
2. Door assembly consisting of HM Steel Stiffened Door, ligature resistant mortise lockset, double acting hinge with 105-degree opening, operated by oval-drive staff key which also operates anti-barricade stop.
 - a. Configuration: Single Leaf - SWD01.
 - b. Size: As indicated on the Drawings.
3. Frame assembly to be constructed of minimum 14-gauge mild steel, fully welded, having single-rabbet strike jamb to coordinate with anti-barricade stop, flush hinge jamb, and flush header. Strike included.
4. Emergency stop assembly to consist of hinged stop with two locking points on jamb, operated by oval drive staff key.
5. Hardware:
 - a. Double acting continuous hinge: KG202 Swing Hinge double acting continuous hinge by Kingsway Group
 - b. Ligature Resistant Mortise Lock set: Per Schedule
 - c. Anti-barricade stop: Kingsway SwingStop anti-barricade stop with two locking points by Kingsway Group – KG207.
6. Construction: Door to be made having a steel stiffened core. Assembly to be completed with Pin Torx Security Fasteners throughout.
7. Finishes:
 - a. Door Frame: finished with manufacturer's factory-applied powder-coat finish in color as scheduled on the Drawings.
 - b. Door Face: Manufacturer's standard Veneer in White Oak - CL18.

- B. Anti-Barricade Ligature-Resistant Doorset (**Door Type F3**): SWING Anti-Barricade Doorset.

1. Complete doorset delivered in three sections: door assembly, frame assembly, and emergency stop assembly. Additional hardware provided separately with assembly.
2. Door assembly consisting of HM Steel Stiffened Door, ligature resistant mortise lockset, double acting hinge with 105-degree opening, operated by oval-drive staff key which also operates anti-barricade stop.
 - a. Configuration: Leaf and a Half - SWD03.

February 27, 2026

- b. Size: As indicated on the Drawings.
 - 3. Frame assembly to be constructed of minimum 14-gauge mild steel, fully welded, having single-rabbit strike jamb to coordinate with anti-barricade stop, flush hinge jamb, and flush header. Strike included.
 - 4. Emergency stop assembly to consist of hinged stop with two locking points on jamb, operated by oval drive staff key.
 - 5. Hardware:
 - a. Double acting continuous hinge: KG202 Swing Hinge double acting continuous hinge by Kingsway Group
 - b. Ligature Resistant Mortise Lock set: Per Schedule
 - c. Anti-barricade stop: Kingsway SwingStop anti-barricade stop with two locking points by Kingsway Group – KG207.
 - 6. Construction: Door to be made having a steel stiffened core. Assembly to be completed with Pin Torx Security Fasteners throughout.
 - 7. Finishes:
 - a. Door Frame: finished with manufacturer's factory-applied powder-coat finish in color as scheduled on the Drawings.
 - b. Door Face: Manufacturer's standard Veneer in White Oak - CL18.
- C. Factory Priming:
- 1. Clean, phosphatize, and prime paint exposed surfaces of steel doors and frame units, including galvanized surfaces.
 - 2. Clean steel surfaces of mill scale, rust, oil, grease, dirt, and other foreign materials before application of paint.
 - 3. Apply factory coat of prime paint to an even consistency to provide a uniformly finished surface ready to receive finish paint.

2.04 DOOR FRAME FINISHES

- A. Factory Powder-Coat Finish for Swing Door Frames.
- 1. Powder-Coat Finish: Prepare, treat, and coat galvanized metal to comply with resin manufacturer's written instructions and as follows:
 - a. Prepare galvanized metal by thoroughly removing grease, dirt, oil, flux, and other foreign matter.
 - b. Treat prepared metal with zinc-phosphate pretreatment, rinse, and seal surfaces.
 - c. Apply thermosetting polyester or acrylic urethane powder coating with cured-film thickness not less than 1.5 mils (0.04 mm).
 - 2. Color: As scheduled on the drawings.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Examine the areas and conditions where special function doors are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.02 INSTALLATION, DOORS

- A. Coordinate as required with other trades to ensure proper and adequate provision in the work of those trades for interface with the work of this Section.
- B. Install the work of this Section in strict accordance with the original design, the approved Shop Drawings, pertinent requirements of governmental agencies having jurisdiction, and the manufacturer's recommended installation procedures.

3.03 TOLERANCES

- A. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
 - 1. Squareness: Plus, or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - 2. Alignment: Plus, or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
 - 3. Twist: Plus, or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - 4. Plumbness: Plus, or minus 1/16 inch, measured at jambs at floor.

3.04 ADJUST AND CLEAN

- A. Factory Coat Touch-up: Immediately after erection, sand smooth any rusted or damaged areas of factory coating and apply touch-up of matching air-drying coating.
- B. Final Adjustments: Check and readjust operating finish hardware items, leaving steel frames undamaged and in complete and proper operating conditions.

END OF SECTION

SECTION 08341 – SLIDING DOOR OPENING ASSEMBLIES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Sliding door, frame, and hardware assemblies.
- B. Aluminum-Framed Top-Hung Sliding Doors.

1.02 RELATED REQUIREMENTS

- A. Section 087100 – Door Hardware.

1.03 REFERENCE STANDARDS

- A. AAMA 609 and 610 – Cleaning and Maintenance Guide for Architecturally Finished Aluminum (Combined Document) 2015.
- B. ANSI A156.18 – American National Standard for Materials and Finishes
- C. ANSI A117.1 – American National Standard for Specifications to Make Buildings and Facilities Accessible and Usable to People with Physical Disabilities
- D. AWS – Architectural Woodwork Standards
- E. BHMA – Builders Hardware Manufacturers Association
- F. DHI- Door and Hardware Institute

1.04 SUBMITTALS

- A. See Section 013300 – Administrative Requirements for submittal procedures.
- B. Product Data: Provide component dimensions, and descriptions of hardware and accessories.
- C. Shop Drawings: indicate opening dimensions, elevations of different types, framed opening tolerances, and installation requirements.
- D. Samples: Submit two samples, 12 inches (305 mm) long indicating typical sliding door frame construction, accessories, and finishes. Samples should be labeled with a full description to coordinate with the schedule.
- E. Manufacturer's Certification: Certify that sliding doors meet or exceed expectations.
- F. Manufacturer's Installation Instructions: Include complete preparation, installation, and cleaning requirements.
- G. Manufacturer's qualification statement.
- H. Installer's qualification statement.
- I. Shop Drawings: Indicate details of each opening showing elevations, glazing, frame profiles, hardware, and different finish locations, if any.

J. Informational Submittals:

1. Provide Product Data:

- i Specified door hardware must have warranties included.
- ii Provide product qualification data for Sliding Doors for: Architect, Installer, and Architectural Specification Consultant.

K. Closeout Submittals:

1. Provide Maintenance and Operations Data corresponding to Division 01.

- i Provide information and data about maintenance, repairs, and adjustment for Sliding Door System, in addition to replacement parts and how to preserve finishes within 72 hours of requests.
- ii Provide Complete Catalog cuts and pages for all parts of Sliding Door System.
- iii Provide parts list for each component of Sliding Door System.
- iv Provide name, address, and telephone number of local representative of Sliding Door System manufacturer.
- v Warranty for Sliding Door System shall include reference numbers for manufacturer and identification of project it is specified in.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with a minimum of five years documented experience.
- B. Drawings provided will indicate size, dimensional requirements of interior aluminum frames/doors and profiles.

1.06 WARRANTY

- A. See Section 017700 – Closeout Procedures, for additional warranty requirements.
- B. Provide manufacturer's standard warranty against defects in material and workmanship:
 - 1. For entire door opening assembly, provide two-year warranty period after Date of Substantial Completion.
 - 2. Warranty shall be void unless units are stored in accordance with manufacturer's instructions prior to installation.
 - 3. Warranty shall be void unless units are installed by a factory certified installer.
 - 4. Assurance Program: Company specializing in manufacturing the products specified in this section shall offer Technical training and project support pre and post installation.

1.07 PERFORMANCE

- A. Enhanced gasket and seals integrated in all door/frame interfaces with aluminum perimeter frames. Architect will verify wall thickness required for application.
- B. Commercial grade anti-slam soft close and open system with back stop reinforcement. Closers test to a minimum of 100,000 cycles.
- C. Concealed Floor Guide and Wall Mount Guide
- D. Acoustical performance testing provided by third party. Manufacturer to submit test data as required.
 - a. Acoustic Rating: Minimum STC 35 rated sounds control assemblies tested at an independent acoustic laboratory in accordance with ASTM E90 Sealed-In-Place Standard.
 - b. 3-sided perimeter seal system as part of door assembly.
- E. Air infiltration and smoke ratings provided by third party. Manufacturer to submit test data as required. Reference UL1784 Testing Data.

1.08 DELIVERY, STORAGE AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up for door hardware and sliding door materials delivered to Project site. Keep all materials in their original, unopened containers/ packaging until installation.
- B. Tag each item or package separately with identification coordinated with the final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item to package.
- C. Manufacturer will be immediately notified of any damage caused during shipping.
- D. Store and handle all materials according to manufacturer's instructions.
- E. Store all materials indoors in dry, clean areas.
- F. Protect all materials and finishes during the storage, handling, and installation to prevent damage.

1.09 COORDINATION

- A. Coordinate layout and installation of floor-recessed door hardware with floor construction.
- B. Verify if measurements for Sliding Door Systems are calculated from Door Slab Width or Clear Opening in Door Schedule.
- C. Installation Templates: Distribute doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- D. Security: Coordinate installation of door hardware, sliding door materials and access control with Owner's security consultant.
- E. Existing Openings: Where hardware components are scheduled for application to existing construction or where modifications to existing door hardware are required,

field verify existing conditions and coordinate installation of hardware and sliding door materials to suit opening conditions to provide proper door operation.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Sliding Door Assemblies – Manufacturer: Serenity Sliding Door Systems, 4710 Northpark Drive, Suite 100, Colorado Springs, CO 80907. Ph. 719-212-6007.

2.02 INTERIOR ALUMINUM-FRAMED SLIDING DOORS/ PARTITIONS

- A. Manufacturer:
 - 1. Scheduled Manufacturer:
 - i. MedSlide Pro Surface Mount High Performance Sliding Door System by Serenity Sliding Door Systems
 - 2. Acceptable Substitute: Products manufactured by others that meet or exceed this specification may be considered if the request is submitted within the parameters outlined in the bidding documents.
- B. Provide clear aluminum top track, receiving channel, carriage assemblies, full gasketing, sidelights, transoms, pulls and or locks, and related components.
- C. Assembly:
 - 1. Provide wall blocking within metal stud walls as required by manufacturer of sliding door assembly.
 - 2. Joints and Connections: Flush, hairline width, and waterproof, accurately, and rigidly joined corners.
- D. Wood Door Finish: As indicated on Drawings.
- E. Frame Profiles: Extruded aluminum Cased Opening Frame with Snap on Trim with replaceable receiving channel.
- F. Handles:
 - 1. Standard Back-to-Back Ladder Pull” 12” long x 1” diameter. Finish US32D Satin Stainless Steel
- G. Finish:
 - 1. Clear Anodized (Standard)
- H. Track System Components:
 - 1. Clear Anodized finish pre-installed rolling track system set to manufacturer specifications.
 - i. Preinstalled Track System Components
 - ii. Preinstalled Soft Close and Roller Assembly
 - 2. Fascia: Extruded Aluminum with end caps

- 3. Quiet comfort roller system
- 4. Automatic Door Bottom
- I. Optional Accessories:
 - 1. Acoustic Door Bottom
 - 2. Mechanical Spring Closer
- J. Door thickness: 1 3/4 Inches.
- K. STC Rating of Assembly:
 - 1. STC 35 (As Required).

2.03 DOOR OPERATING HARDWARE

- A. Manufacturers: Door hardware manufactures are as determined by the manufacture of the integrated Door Opening Assemblies in compliance with specified hardware requirements for applications as indicated.
- B. Back-to-Back ladder pulls installed with concealed set screw under the pull.
- C. Hardware Options: See Section 087100 – Door Hardware.
- D. Door Lock Functions:
 - 1. Back-to-Back Ladder Pulls w/ Deadlock:
 - i. SD5340i: Privacy w/ Emergency Release and Indicator with a Back-to-Back Ladder Pull ADA Compliant thumbturn.
 - 2. Mortise Lock with Levers – Single Action Egress
 - i. SD9540: Privacy w/ Emergency Release
 - 3. Auto Latching Mortise Lock with Levers – Single Action Egress:
 - i. SD9640: Privacy – Indicator with Thumbturn

2.04 DOOR LEAVES

- A. Door Leaves must be factory machined and prepped for hardware, including function and pilot holes.
 - 1. 1-3/4 inch Flush Wood Door. Reference Spec Section 08 14 16 Wood Doors.
 - i. Standard Stile widths are 6" with a 10" bottom rail.
 - 2. Door Slab size 8 inch larger than clear opening width.

2.05 DOOR COMPONENTS

- A. Extra Heavy Duty Clear Anodized Aluminum Track System (Made in the USA)
- B. Receiving Channel
- C. Perimeter Seal System
- D. Soft Close and Open System

- E. Pre-installed Track
- F. Aluminum Cased Open Frame
- G. Snap-on Trim
- H. Bottom Door Guide

2.06 FINISHES

- A. Door Hardware: Provide door hardware of the same finish, unless otherwise indicated.
 - 1. Finish: US32D Stain Stainless Steel – Pulls, Lockbodies, Thumbturns, Indicators
 - 2. Finish: US26D – Key Cylinders
- B. Serenity Track System:
 - 1. PEP: Powder coat painting. (Please provide the color and manufacturer of the powder).
- C. Wood Door Finish: Refer to Section 081416 “Flush Wood Doors”

PART 3 - EXECUTION

3.01 VERIFICATION

- A. Verify that wall thickness is consistent and matches wall types called out on plans.
- B. Verify wall openings are plumb, square, level, and true.
- C. Verify that openings are ready to receive work and opening dimensions and clearances are as indicated on approved shop drawings.
- D. Verify that floor is level.
- E. Notify the owner and architect if any conditions are present that could affect door installation or performance.
- F. Do not begin Installation if the above conditions are not remedied.

3.02 INSTALLATION

- A. Verify that all installers have reviewed all training materials in installation of Sliding Door Systems.
 - 1. Provide proper training for installation of Serenity Sliding Door System Products.
- B. Install doors in accordance with manufacturer's requirements and instructions.
- C. Coordinate frame anchor placement with wall construction.
- D. Adjust sliding doors for correct orientation according to manufacturer's instructions.

3.03 TOLERANCES

- A. Maintain dimensional tolerances and alignment with adjacent work.
- B. Maximum Variation from Plumb: 1/16 inch (1.6 mm).
- C. Maximum Variation from Level: 1/16 inch (1.6 mm).
- D. Longitudinal or Diagonal Warp: Plus, or minus 1/8 inch (3.2 mm) from 10 foot (3 m) straight edge.

3.04 MAINTENANCE

- A. Damage to Sliding Door must be repaired in accordance with instructions of manufacturer and approval from architect and owner.
- B. Protect sliding doors from damage during construction and installation.
- C. Protect installed products from damage until Date of Substantial Completion.

3.05 CLEANING

- A. Remove protective material from factory finished surfaces.
- B. Remove labels and visible markings.
- C. Wash surfaces by method recommended and acceptable to sealant and sliding door manufacturer; rinse and wipe surfaces clean.
- D. See Section 017419 - Construction Waste Management and Disposal, for additional requirements.

END OF SECTION

SECTION 08460 – SLIDING AUTOMATIC ENTRANCE DOORS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Aluminum framed exterior, Telescopic sliding, power-operated automatic doors with operator, motion/presence sensor control device that have been manufactured, fabricated and installed to maintain performance criteria specified without defects, damage or failure.

B. Related Sections:

1. Section 07910 – EXTERIOR WALL JOINT SEALANTS.
2. Section 08520 – GLAZED ALUMINUM SYSTEMS
3. Section 08710 – FINISH HARDWARE.
4. Section 08800 - GLAZING.
5. Section 16000 – GENERAL REQUIREMENTS FOR ELECTRICAL WORK

1.02 SYSTEM DESCRIPTION

A. Doors Powered to Open Position:

1. Doors powered by DC electric motor and mechanical gear assembly transmitted to active leaves by fiberglass-reinforced tooth drive belt transport system.
2. Power door to open position by signals received by microprocessor from the actuation controls.
3. The last portion of the opening cycle shall be controlled by a microprocessor generated signal that electronically reduces voltage to motor until door is fully open.
4. To permit safe passage if an obstruction is detected between opening doors and surrounding walls or interior fittings, the doors shall immediately stop and after a delay go to the full closed position.

B. Doors Powered to Closed Position:

1. The active leafs will only be powered to closed position when all actuating devices are cleared and after remaining in the open position for a preset time delay (per ANSI standards).
2. The last portion of the closing cycle shall be controlled by a microprocessor generated signal that electronically reduces voltage to the motor until door is fully closed.
3. To permit safe passage between closing doors, the doors immediately reverse to open position if an obstruction is detected, then resume their interrupted movement at low speed to check whether the obstruction has disappeared or not.

C. Watchdog Monitoring:

February 27, 2026

1. Microprocessor Software: Constantly monitor drive train system operations.
2. Watchdog Control Circuit: Assume command of system and shut down automatic function by holding doors open, should door speed, motor function, or drive train operations deviate from design criteria ranges.
3. Secondary Supervisory Circuit: Monitor main Watchdog control circuit every 255 door cycles, ready to perform as a backup.

1.03 PERFORMANCE REQUIREMENTS

- A. General: Provide package that has been designed and fabricated to comply with specified performance requirements, as demonstrated by testing manufacturer's corresponding standard systems.
- B. Structural Performance: Automatic entrances shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to IBC 2018 and ASCE/SEI 7.
 1. Windload Criteria:
 - a. Design Wind Speed: 168 mph in three second gusts.
 - b. Exposure: C
 - c. Importance Factor: 1.5
 2. Design corners for simultaneous positive (inward) design pressures on both surfaces, and simultaneous negative (outward) design pressure on both surfaces.
 3. Partial loading on one surface shall also be considered.
 4. Deflection for metal members supporting glass, the performance criteria shall be as follows:
 - a. Perpendicular to the plane of the wall, net deflection of framing members shall be per AAMA TIR-A11 and shall not exceed 1/175 times span for spans up to 13' – 6".
 - 1) Where a sealant joint occurs between a framing member and a relatively stiff building element, framing member deflection shall not exceed ½ of the nominal joint width, or less if required by sealant manufacturer.
 - 2) Where a framing member runs continuously past a deflecting support, the support deflection shall be considered in the analysis.
 - b. In the plane of the wall, deflection of framing members shall not exceed 1/8 inch. This includes horizontal rail sag due to dead load. Any twist of the horizontal sill members due to dead load shall be limited to 1 degree.
 - c. At connection points of framing members to anchors, combined movement of anchor relative to building structure, and framing member relative to anchor, shall not exceed 1/16 inch in any direction.

- d. Stresses shall not exceed the allowable values established by the specifications listed in code standards. In no case shall allowable values exceed the yield stress. Where permitted by code, a 1/3 increase in allowable stress for wind or seismic load is generally acceptable, but not in combination with any reduction applied to combined loads.
 - e. Sealants and interior finishes shall not be assumed to contribute to framing member strength or stiffness.
- 5. Performance criteria at safety loads (150% design load) for metal members supporting glass, the performance criteria shall be as follows:
 - a. For metal members supporting glass the net permanent deflection of framing members shall not exceed 1/1000 times span.
 - b. There shall be no failure or gross permanent distortion of framing members, anchors or connections.
 - c. At connection points of framing members to anchors, combined movement of anchor relative to building structure, and framing member relative to anchor, shall not exceed 1/16-inch set after load is removed
- 6. Seismic Loads: As determined by IBC 2018 and ASCE/SEI 7.
- C. Operating Temperature Range: Provide automatic entrances that operate within minus 20 to plus 122 deg F.
- D. Air Infiltration: Maximum air leakage through fixed glazing and framing areas of 1.25 cfm/sq. ft. of fixed entrance system area when tested according to ASTM E 283 at a minimum static-air-pressure difference of 1.57 lbf/sq. ft.
- E. Opening-Force Requirements:
 - 1. Power-Operated Doors: Not more than 50 lbf required to manually set door in motion if power fails, and not more than 15 lbf required to open door to minimum required width.
- F. Entrapment Force Requirements:
 - 1. Power-Operated Sliding Doors: Not more than 30 lbf required to prevent stopped door from closing.
 - 2. Sliding doors provided with a breakaway device shall require no more than 50lbf applied 1 inch from the leading edge of the lock stile for the breakout panel to open.
- G. Forced-Entry Resistance for Aluminum Framed Doors: Performance Level 10 per ASTM F 842 tested per AAMA 1303.5.

1.04 SUBMITTALS

- A. Comply with Section 01330 - SUBMITTAL PROCEDURES.
- B. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for automatic entrances. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

- C. Shop Drawings: For automatic entrances. Include plans, elevations, sections, details, hardware mounting heights, and attachments to other work.
 - 1. Wiring Diagrams: For power, signal, and control wiring.
 - 2. Activation and safety devices.
 - 3. Include hardware schedule and indicate hardware types, functions, quantities, and locations.
- D. Coordinated Calculation Submission:
 - 1. Provide structural calculations, sealed by a Professional Engineer currently licensed in the State of Hawaii prepared in compliance with referenced documents and these specifications.
 - 2. Where specifications and code differ, the more severe requirements shall govern. Test reports are not an acceptable substitute for calculations. Calculations shall include the following information:
 - a. Analysis for all applicable loads on framing members.
 - b. Deflection limitations of glass framing system.
 - c. Analysis for all applicable loads on anchors, including anchors embedded in concrete.
 - d. Section property computations for framing members.
 - e. Certification of conformance with structural test pressures and design pressures indicated. Include evidence of compliance by submission of product test reports with notations as required by professional engineer.
- E. Samples for Verification: Submit manufacturer's samples of aluminum finishes in manufacturer's standard sizes.
- F. Qualification Data: For Installer, manufacturer and certified inspector.
- G. Product Certificates: For each type of automatic entrance, from manufacturer.
- H. Product Test Reports: Submit certified test reports from UL, CUL, and ICBO indicating doors comply with specified performance requirements.
- I. Field Quality-Control Reports: Submit manufacturer's field reports from AAADM certified technician of inspection and approval of doors for compliance with ANSI/BHMA 156.10 after completion of installation.
- J. Maintenance Data: For automatic entrances, safety devices, and control systems to include in maintenance manuals.
- K. Warranties: Sample of special warranties.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A manufacturer with company certificate issued by AAADM, continuously engaged in manufacturing of doors of similar type to that specified, with a minimum of 10 years successful experience.
 - 1. Door, frame, operator, and sensor components from same manufacturer.
- B. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation and maintenance of units required for this Project.

February 27, 2026

1. Minimum of 3 years documented successful experience in installation of similar doors.
2. AAADM certified.
- C. Certified Inspector Qualifications: Certified by AAADM.
- D. 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.
- E. Source Limitations for Automatic Entrances: Obtain each type of door, frame, operator and sensor components specified in this Section from a single source, same manufacturer unless otherwise indicated.
- F. Power-Operated Door Standard: BHMA A156.10.
- G. Preinstallation Conference: Conduct conference at Project site.
 1. Review methods and procedures related to automatic entrances including, but not limited to, the following:
 - a. Construction schedule. Verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - b. Coordination with electrical, glazing, and other trades.
 - c. Required testing, inspecting, and certifying procedures.
- H. Emergency Exit Door Requirements: Comply with requirements of authorities having jurisdiction for automatic entrance doors serving as a required means of egress.

1.06 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions of openings to receive automatic entrances by field measurements before fabrication.

1.07 COORDINATION

- A. Templates: Obtain templates for doors, frames, and other work specified to be factory prepared for installing automatic entrances, and distribute to parties involved. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing automatic entrances to comply with indicated requirements.
- B. Coordinate hardware with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish. Coordinate hardware for automatic entrances with hardware required for rest of Project.
- C. Electrical System Roughing-in: Coordinate layout and installation of automatic entrances with connections to power supplies and access-control system.

1.08 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of automatic entrances that fail in materials or workmanship within specified warranty period.

February 27, 2026

1. Failures include, but are not limited to, the following:
 - a. Faulty operation of operators, controls, and hardware.
 - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.
 2. Warranty Period: Two (2) years from Project Acceptation date.
- B. Manufacturer shall have in place a dispatch procedure that shall be available 24 hours a day, 7 days a week for emergency call back service.

1.09 MAINTENANCE SERVICE

- A. Initial Maintenance Service: Beginning at Substantial Completion, provide 12 months' full maintenance by skilled employees of automatic entrance Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper automatic entrance operation at rated speed and capacity. Provide parts and supplies the same as those used in the manufacture and installation of original equipment.
1. Engage a certified inspector to perform safety inspection after each adjustment or repair and at end of maintenance period. Furnish completed inspection reports to Owner.
 2. Perform maintenance, including emergency callback service, during normal working hours.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Aluminum: Doors and Frames to be constructed of extruded aluminum, Alloy 6063-T5.
1. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221.
 2. Sheet and Plate: ASTM B 209.
- B. Steel Reinforcement: With manufacturer's standard corrosion-resistant primer complying with SSPC-PS Guide No. 12.00 applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard.
1. Structural Shapes, Plates, and Bars: ASTM A 36.
 2. Cold-Rolled Sheet and Strip: ASTM A 1008.
 3. Hot-Rolled Sheet and Strip: ASTM A 1011.
- C. Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, Type 316 stretcher-leveled standard of flatness, in entrance manufacturer's standard thickness.
- D. Glass: Insulating Glass Units, 1-inch thick as specified in Section 08800 – EXTERIOR GLAZING

- E. Sealants and Joint Fillers: As specified in Section 07910 – EXTERIOR WALL JOINT SEALANTS.
- F. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, non-staining, nonbleeding fasteners and accessories compatible with adjacent materials.

2.02 SLIDING AUTOMATIC ENTRANCES

- A. General: Provide manufacturer's standard automatic entrances including doors, sidelites, framing, headers, carrier assemblies, roller tracks, door operators, activation and safety devices, and accessories required for a complete installation.
 - 1. Operator Features:
 - a. Power opening and closing.
 - b. Drive System: Mechanical gear system or belt.
 - c. Adjustable opening and closing speeds.
 - d. Adjustable hold-open time between 0 and 60 seconds.
 - e. Obstruction recycle.
 - f. On-off/hold-open switch to control electric power to operator, key operated.
 - g. Energy-conservation switch that reduces door-opening width.
 - 2. Sliding Door Carrier Assemblies and Overhead Roller Tracks: Manufacturer's standard carrier assembly that allows vertical adjustment; consisting of nylon- or delrin-covered, ball-bearing-center steel wheels operating on a continuous roller track, or ball-bearing-center steel wheels operating on a nylon- or delrin-covered, continuous roller track. Support doors from carrier assembly by cantilever and pivot assembly.
 - a. Rollers: Minimum of two ball-bearing roller wheels and two anti-rise rollers for each active leaf.
 - 3. Sliding Door Guide Track/Threshold Configuration: Breakout Entrance Guide Track Recessed floor mounted aluminum guide track(s) adjacent to the sidelite portion of the sliding automatic door assembly
 - 4. Combination Activation and Safety Device: Combination motion/presence sensor.
 - a. Activation Device: Motion sensor mounted on each side of door header to detect pedestrians in activating zone and to open door.
 - b. Safety Devices: Presence sensor mounted on each side of door header to detect pedestrians in presence zone and to prevent door from closing.
 - 5. Sidelite Safety Device: Presence sensor, mounted above each sidelite on side of door opening through which doors travel, to detect obstructions and to prevent door from opening.
- B. Automatic Entrance – Telescopic Bi-Parting:

February 27, 2026

1. Basis-of-Design: Subject to compliance with requirements, provide Besam SL500 Telescopic Automatic Sliding Entrance with Stile and Rail Panels as manufactured by ASSA ABLOY; or comparable product by one of the following:
 - a. Stanley Logistics, LLC.
 - b. Horton Automatics; Div. of Overhead Door Corporation.
 - c. Sierra Automatic Doors, Inc
 2. Configuration:
 - a. Identified on the drawings as **(SG4)**: Non-impact, Full Breakout, Telescopic Bi-parting Sliding doors, 6 equal panel unit with four operable leaves and two sidelites on each side.
 - 1) Traffic Pattern: Two-way.
 - 2) Emergency Breakaway Capability: Sliding Leaves and Sidelites.
 - 3) Mounting: Overhead Header installed Between jambs.
- C. Automatic Entrance – Telescopic Single Slide:
1. Basis-of-Design: Subject to compliance with requirements, provide, Besam SL500 Telescopic Automatic Sliding Entrance with Stile and Rail Panels as manufactured by ASSA ABLOY; or comparable product by one of the following:
 - a. Stanley Logistics, LLC.
 - b. Horton Automatics; Div. of Overhead Door Corporation.
 - c. Sierra Automatic Doors, Inc
 2. Configuration:
 - a. Identified on the drawings as **(SG3)**: Non-impact, Full breakout, Telescopic Single Slide, Sliding doors three equal panel unit, with two operable leaves and one sidelite.
 - 1) Traffic Pattern: Two-way.
 - 2) Emergency Breakaway Capability: Sliding Leaves and Sidelites.
 - 3) Mounting: Overhead header installed between jambs.

2.03 ENTRANCE COMPONENTS

A. Aluminum Framed Automatic Doors:

1. Door and Sidelight Framing Members: Manufacturer's standard extruded aluminum, minimum 0.125-inch-thick and reinforced as required to support imposed loads.
 - a. Nominal Size: 1-3/4 by 6 inches.
2. Stile and Rail Doors: Manufacturer's standard 1-3/4-inch- thick glazed doors with minimum 0.125-inch- thick, extruded-aluminum tubular stile and rail members. Mechanically fasten corners with reinforcing brackets

- that are welded or incorporate concealed tie-rods that span full length of top and bottom rails.
- a. Glazing Stops and Gaskets: Beveled, snap-on, extruded-aluminum stops and manufacturer's standard preformed gaskets.
- b. Stile Design: Narrow stile; 2-1/8-inch.
- c. Rail Design: Top rail to match stile width, 10-inch nominal height for bottom rail.
- B. Headers: Fabricated from minimum 0.125-inch thick, extruded aluminum and extending full width of automatic entrance units to conceal door operators and controls, and roller track. Provide hinged or removable access panels for service and adjustment of door operators and controls. Secure panels to prevent unauthorized access.
 - 1. Mounting: Concealed, with one side of header flush with framing.
 - 2. Size: 6-1/2 inches (165.1 mm) wide by 7 inches (177.8 mm) high.
 - a. Header height including the sensor plate cap which spans the clear door opening width is 8 inches (203.2 mm) high.
 - 3. Capacity:
 - a. Aluminum Framed Doors: Capable of supporting doors up to 220 pounds per leaf over spans up to 14 feet without intermediate supports.
 - b. Provide sag rods for spans exceeding 14 feet.
 - 4. Access: Continuous hinge at top of header allows cover to swing and allow complete access to operator and internal electronic and mechanical assemblies.
 - 5. Design: Closed header when doors in closed position.
- C. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
- D. Signage: Affixed to both sides of each door as required by BHMA A156.10 for type of door and its operation.
 - 1. Application Process: Decals.
 - 2. Provide sign materials with instructions for field application after glazing is installed.

2.04 DOOR OPERATORS AND ACTIVATION AND SAFETY DEVICES

- A. Door Operators: Provide door operators of size recommended by manufacturer for door size, weight, and movement; for condition of exposure; and for long-term, maintenance-free operation under normal traffic load for type of occupancy indicated.
 - 1. Electro-mechanical controlled unit utilizing a high-efficiency, energy efficient, DC motor requiring a maximum of 3 amp current draw, allowing 5 operators on one 20 amp circuit. The supplied system shall have the capability to operate at full performance well beyond a brown out and high line voltage conditions (85V – 265V) sensing changes and adjusting

- automatically. The operator shall allow an adjustable hold open time delay of 0 to 60 seconds and have internal software to incorporate a self-diagnostic system.
- 2. Operating Temperature Range: -31° F to 130° F (-35° C to 54.44° C).
- B. Combination Motion/Presence Sensors: Self-contained units; consisting of both motion and presence sensors in a single metal or plastic housing; adjustable to provide detection field sizes and functions required by BHMA A156.10 mounted on each side of the header.
 - 1. Motion Sensor: K-band-frequency, microwave-scanner units; with relay hold time of not less than 2 to 10 seconds.
 - a. Provide capability for switching between bidirectional and unidirectional detection.
 - 2. Presence Sensor: Infrared-scanner units; with relay hold time of not less than 2 to 10 seconds. Sensors shall remain active at all times.
 - 3. The sensor shall communicate with the automatic door operator through a self-monitoring connection that allows the door to go into a fail-safe mode preventing the door from closing in the event of a sensor failure
- C. Mode Selector Control: Type as selected by architect from manufacturer full range, mode selector control shall allow selection of the indicated functions to be engaged when switch is turned to the appropriate setting.
 - 1. Mounting: As indicated on the drawings.
 - 2. Mode selector control to allow the following functions:
 - a. "Off"
 - b. "Exit Only" one way traffic with automatic operation from the interior.
 - c. "Two Way Traffic" allowing automatic operation from exterior and interior.
 - d. "Partial Opening" energy saving door position allows door to automatically adjust opening width based on amount of usage, that is, full open during high use and partial open during low use. The control for this setting is programmable allowing adjustment to both the usage setting and the opening width.
 - e. "Hold Open" doors activated and held in the full open position.
- D. Electrical Interlocks: Unless units are equipped with self-protecting devices or circuits, provide electrical interlocks to prevent activation of operator when door is locked, latched, or bolted.
- E. Full Breakout sliding entrances shall include two interlocks per moving panel securing the leading stile of the sidelite and the butt stile of the sliding door panel together.

2.05 HARDWARE

- A. General: Provide units in sizes and types recommended by automatic entrance and hardware manufacturers for entrances and uses indicated. Finish exposed parts to match door finish unless otherwise indicated. Hardware not limited to the following:

February 27, 2026

1. Breakaway arms and bottom pivot assemblies shall be supplied by the manufacturer and shall be adjustable to comply with the specifications herein and applicable codes.
 2. Magnetic catch(s) to retain breakout door and sidelite panels in the closed position.
 3. Wind resistant hydraulic damper to control movement of the breakout panels.
 4. Locking Hardware:
 - a. Electrified slide lock at emergency egress on secured entrances shall automatically lock the sliding function of all sliding door panels within the entrance when the door panels are in the closed position.
 - 1) Fail secure operation, as indicated on the schedule, shall lock the sliding door function of the door panels upon loss of power.
 - 2) Fail safe operation, as indicated on the schedule, shall unlock the sliding function of the door panels upon loss of power.
 - 3) Exterior Jamb mounted key switch to unlock sliding door operation.
 - b. Exit devices shall lock the breakout function while allowing emergency egress at all times. Exit devices in combination with the automatic slide locking hardware to be provided on secured doors. Automatic locking for the sliding door when the door control switch is in the closed position.
 - 1) Flush mounted Adams-Rite F86 Series, concealed vertical rod exit devices mounted to the leading sliding panels.
 - c. Deadlocks: Manufacturer's standard deadbolt operated by exterior cylinder and interior thumb turn, with minimum 1-inch-long throw bolt; BHMA A156.5, Grade 1.
 - 1) Cylinders as specified in Section 07810 – FINISH HARDWARE.
 - 2) Keying – Integrate into building master key system.
- B. Dustproof Strikes: As specified in Section 08710 – FINISH HARDWARE
- C. Weather Stripping: Manufacturer's standard replaceable components.
1. Sliding Type: AAMA 701, made of wool, polypropylene, or nylon woven pile with nylon-fabric or aluminum-strip backing. The following types of weather-stripping are required:
 - a. Complementing weather-stripping on the joining vertical stiles of the sidelite and sliding door panels
 - b. Complementing weather-stripping on the lead edge of the lock stiles of bi-parting doors.
 - c. Single pile weather-stripping between the carrier and the header

- d. Single pile weather-stripping on the lead edge stile of single slide door panels
- e. Dual pile weather-stripping on the pivot stile of breakout sidelite panels.
- f. Dual pile weather-stripping on the butt stile of fixed sidelite panels.
- g. Bottom rails shall be provided with an adjustable nylon sweep

2.06 FABRICATION

A. General: Factory fabricate automatic entrance components to designs, sizes, and thicknesses indicated and to comply with indicated standards.

- 1. Form aluminum shapes before finishing.
- 2. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- 3. Use concealed fasteners to greatest extent possible. Where exposed fasteners are required, use countersunk Phillips flat-head machine screws fabricated from stainless steel.
 - a. Where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration, use self-locking devices.
 - b. Reinforce members as required to receive fastener threads.
- 4. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.

B. Framing: Provide automatic entrances as prefabricated assemblies. Complete fabrication, assembly, finishing, hardware application, and other work before shipment to Project site.

- 1. Fabricate tubular and channel frame assemblies with manufacturer's standard welded or mechanical joints. Provide subframes and reinforcement as required for a complete system to support required loads.
- 2. Perform fabrication operations in manner that prevents damage to exposed finish surfaces.
- 3. Form profiles that are sharp, straight, and free of defects or deformations.
- 4. Provide components with concealed fasteners and anchor and connection devices.
- 5. Fabricate components with accurately fitted joints with ends coped or mitered to produce hairline joints free of burrs and distortion.
- 6. Fabricate exterior components to drain water passing joints and condensation and moisture occurring or migrating within system to the exterior.
- 7. Provide anchorage and alignment brackets for concealed support of assembly from building structure.

8. Allow for thermal expansion of exterior units.
- C. Doors: Factory fabricated and assembled in profiles indicated. Reinforce as required to support imposed loads and for installing hardware.
- D. Door Operators: Factory fabricated and installed in headers, including adjusting and testing.
- E. Glazing: Fabricate framing with minimum glazing edge clearances for thickness and type of glazing indicated, according to GANA's "Glazing Manual."
- F. Hardware: Factory install hardware to greatest extent possible; remove only as required for final finishing operation and for delivery to and installation at Project site. Cut, drill, and tap for factory-installed hardware before applying finishes.
 1. Provide sliding-type weather stripping, mortised into door, at perimeter of doors.
- G. Activation and Safety Devices:
 1. General: Factory install devices in doors and headers as required by BHMA A156.10 for type of door and direction of travel.

2.07 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Apply organic finishes to formed metal after fabrication unless otherwise indicated.
- D. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- E. Finish: All exposed aluminum surfaces shall be free of scratches and other blemishes. Pre-clean surfaces and provide a conversion coating and provide exposed surfaces of aluminum with a three coat, Fluoropolymer (70 percent PVDF) Coating System, factory-applied, oven baked conforming to AAMA 2605, "Superior Performance Organic Coatings on Aluminum Extrusions and Panels", with a total dry film thickness of not less than 1.2 mils.
 1. Color: As selected by architect from manufacturers full color range.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances, header support, and other conditions affecting performance of automatic entrances.
- B. Examine roughing-in for electrical source power to verify actual locations of wiring connections.

February 27, 2026

- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. General: Do not install damaged components. Fit frame joints to produce hairline joints free of burrs and distortion. Rigidly secure nonmovement joints. Seal joints watertight.
 - 1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.
 - 2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
- B. Entrances: Install automatic entrances plumb and true in alignment with established lines and grades without warp or rack of framing members and doors. Anchor securely in place.
 - 1. Install surface-mounted hardware using concealed fasteners to greatest extent possible.
 - 2. Set headers, carrier assemblies, tracks, operating brackets, and guides level and true to location with anchorage for permanent support.
 - 3. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within system to exterior.
- C. Door Operators: Connect door operators to electrical power distribution system as specified in Division 16 Sections.
- D. Activation and Safety Devices: Install and adjust devices to provide detection field and functions indicated.
- E. Glazing: Install glazing as specified in Section 08800 – GLAZING.
- F. Sealants: Comply with requirements specified in Section 07910 – EXTERIOR WALL JOINT SEALANTS to provide weathertight installation.
 - 1. Seal perimeter of framing members with sealant.
 - 2. Set thresholds, bottom guide and track systems and framing members in full bed of sealant.
- G. Signage: Apply signage on both sides of each door as required by referenced door standards.
- H. Wiring within Automatic Entrance Enclosures: Bundle, lace, and train conductors to terminal points with no excess and without exceeding manufacturer's written limitations on bending radii. Provide and use lacing bars and distribution spools.

3.03 FIELD QUALITY CONTROL

- A. Inspection: Engage Installer's AAADM certified inspector to test and inspect automatic entrances and prepare test and inspection reports.
 - 1. Certified inspector shall test and inspect each automatic entrance to determine compliance of installed systems with applicable BHMA standards.

February 27, 2026

2. Inspection Report: Certified inspector shall submit report in writing to Architect and Contractor within 24 hours after inspection.
- B. Work will be considered defective if it does not pass tests and inspections.

3.04 ADJUSTING

- A. Adjust door operators, controls, and hardware for smooth and safe operation and for tight closure; comply with requirements in BHMA A156.10.
- B. Lubricate operating hardware and other moving parts as recommended by manufacturer.
- C. Readjust door operators and controls after repeated operation of completed installation equivalent to 3 days' use by normal traffic (100 to 300 cycles). Lubricate hardware, operating equipment, and other moving parts.
- D. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.

3.05 CLEANING AND PROTECTION

- A. Clean glass and metal surfaces promptly after installation. Remove excess glazing and sealant compounds, dirt, and other substances. Repair damaged finish to match original finish.
 1. Comply with requirements in Section 08800 - GLAZING for cleaning and maintaining glass.

3.06 DEMONSTRATION

- A. Engage a certified inspector to train Owner's maintenance personnel to adjust, operate, and maintain automatic entrances.

END OF SECTION

SECTION 08520 – GLAZED ALUMINUM SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY

- A. This section includes the provision and installation of Glazed Aluminum Systems including Aluminum Sliding Entry Door, Aluminum Telescopic Entry Doors, Aluminum Fixed Exterior Transom Windows, Exterior Glass and Glazing, and Sealants as well as a coordinated installation of this work.
 - 1. The reference to “Glazing Contractor” in this and related Sections shall be the single firm to assume undivided responsibility of the Work as described above and herein
- B. Coordination of the interface of the Glazed Aluminum Systems with other trades as necessary to provide for proper function of the combined exterior wall system components.
- C. Perform and provide all labor, engineering, materials, equipment and all supplementary items necessary to complete, as indicated by the Contract Documents, the proper installation of the Glazed Aluminum Systems. This work includes but is not limited to the following:
 - 1. All exterior Glazed Aluminum Systems, including vision glazing, aluminum trim, and all other features.
 - 2. All glass and glazing for the above components, as specified in Section 08800 - GLAZING.
 - 3. All sealants, caulking, joint fillers and gaskets for a weathertight performance of the Glazed Aluminum Systems, as specified in Section 07910 – EXTERIOR WALL JOINT SEALANTS and Section 07920 - SEALANTS
 - 4. All anchorage of above components, including pre-set inserts in concrete slab (installed by others), kickers, steel or aluminum reinforcing, etc.
 - 5. All vents, weeps, weep tubes, bellows, baffles, closures, end dams, gutters, flashings and trim as shown, or as may be required in conjunction with system or to join systems to adjacent construction.
 - 6. All design, engineering calculations and shop drawings for the complete design of the Glazed Aluminum Systems.
- D. Related work not included in this section:
 - 1. Section 03300 – CAST-IN-PLACE CONCRETE
 - 2. Section 05120 – STRUCTURAL STEEL
 - 3. Section 07910 – EXTERIOR WALL JOINT SEALANTS
 - 4. Section 07920 - SEALANTS
 - 5. Section 08800 – GLAZING

1.02 CODES AND STANDARDS

- A. The work of this section shall comply with the latest edition of the following standards. When conflicts arise between standards, the more stringent shall apply.
- B. AA – Aluminum Association
 - 1. Specifications for Aluminum Structures
- C. FGIA – Fenestration and Glazing Industry Alliance
 - 1. AAMA/WDMA/CSA 101/I.S.2/A440, NAFS 2011 – North American Fenestration Standard/Specification for Windows, Doors and Skylights.
 - 2. AAMA 501.2, Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems.
 - 3. WSG.1, Window Selection Guide
 - 4. AAMA 2605, Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels
 - 5. AAMA 609 & 610, Voluntary Guide Specification for Cleaning and Maintenance of Painted Aluminum Extrusions and Curtain Wall Panels
 - 6. AAMA 800, Test Methods for Sealants
 - 7. AAMA 1503, Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections.
 - 8. RPC, Rain Penetration Control.
 - 9. AAMA 620, Voluntary Specifications for High Performance Organic Coatings on Coil Coated Architectural Aluminum Substrates
 - 10. AAMA TIR A11-96, Maximum Allowable Deflection of Framing Systems for Building Cladding Components at Design Wind Loads
- D. ANSI – American National Standards Institute– Latest Edition
 - 1. ANSI Z97.1, Performance Specifications and Methods of Test for Transparent Safety Glazing Material Used in Buildings
- E. AISC – American Institute of Steel Construction– Latest Edition
 - 1. AISC, Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings", including commentary of the AISC Specifications, latest edition.
 - 2. AISC, Specifications for the Design of Cold - Formed Steel Structural Member", 9th Edition.
- F. ASCE – American Society of Civil Engineers– Latest Edition
 - 1. SEI/ASCE 7, Minimum Design Loads for Buildings and Other Structures
- G. ASTM – American Society for Testing and Materials
 - 1. ASTM A 36, Standard Specification for Carbon Structural Steel
 - 2. ASTM A 123, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

February 27, 2026

3. ASTM B 117, Practice for Operating Salt Spray (Fog) Apparatus
 4. ASTM B 221, Specification for Aluminum - Alloy Extruded Bar, Rod, Wire, Profiles and Tubes
 5. ASTM B 209, Specification for Aluminum and Aluminum-Alloy Sheet and Plate
 6. ASTM B 210, Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes
 7. ASTM B 211, Specification for Aluminum and Aluminum-Alloy Bar, Rod and Wire
 8. ASTM C 509, Specification for Elastomeric Cellular Elastomeric Performed Gasket and Sealing Materials
 9. ASTM C 864, Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks and Spacers
 10. ASTM D 968, Test Method for Abrasion Resistance of Organic Coatings by Falling Abrasive
 11. ASTM D 1654, Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments
 12. ASTM D 2244, Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.
 13. ASTM D 2247, Practice for Testing Water Resistance of Coatings in 100% Relative Humidity
 14. ASTM D 3363, Test Method for Film Hardness by Pencil Test
 15. ASTM D 4214, Test Method for Evaluating Degree of Chalking of Exterior Paint Films
 16. ASTM E 283, Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
 17. ASTM E 330, Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference
 18. ASTM E 331, Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
 19. ASTM E 783, Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors.
 20. ASTM E 1105, Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Curtain Walls and Doors by Uniform or Cyclic Static Air Pressure Difference.
- H. SSPC-Society for Protecting Coatings.
1. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic")
- I. AWS – American Welding Society
1. AWS D1.1, Structural Welding Code – Steel

February 27, 2026

- 2. AWS D1.2, Structural Welding Code – Aluminum
- J. SMACNA – Sheet Metal and Air Conditioning Contractors National Association, Inc.
 - 1. Architectural Sheet Metal Manual
- K. NGA/GANA – National Glass Association/Glass Association of North America
 - 1. Glazing Manual
 - 2. Glazing Sealing Systems Manual
- L. NFPA – National Fire Protection Agency
 - 1. NFPA 101 – Life Safety Code
 - 2. NFPA 105 – Installation of Smoke Door Assemblies
- M. IFI – Industrial Fasteners Institute
 - 1. Handbook on Bolt, Nut and Rivet Standards
- N. UL – Underwriters Laboratories
 - 1. UL 1784 – Air Leakage Test of Door Assemblies
- O. IBC 2018 with Kauai County amendments.

1.03 QUALITY ASSURANCE

- A. Glazing Contractor assumes undivided responsibility for fabrication, installation and total coordination of all components of the Work as described above and herein.
 - 1. Securing a weathertight seal with all systems, surfaces and related materials. Each individual system is to be designed and coordinated with the others to perform as one integrated unit with regards to air infiltration, the collection and removal of water infiltration, the resistance against vapor and performance under both structural and seismic events.
 - 2. This firm must demonstrate not less than 10 years consecutive successful experience in fabrication and installation of work similar to the work of this project. Individual experience does not qualify.
- B. Manufacturer Qualifications: Company with not less than 10 years' experience in manufacturing products similar to scope of this Project with a record of successful in-service performance systems.
- C. Fabricator Qualifications: Company with not less than 10 years' experience with successful production of specified work similar to scope of this Project; with a record of successful in-service performance; and with sufficient capability, facilities, and trained and skilled personnel.
- D. Installer Qualifications:
 - 1. Experience: Company with not less than 10 years' experience in performing specified work similar in design, products, and extent to scope of this Project; with a record of successful in-service performance; and with sufficient production capability, facilities, and trained and skilled personnel.

February 27, 2026

2. Supervision: Maintain a competent supervisor who is at Project during times specified work is in progress, and, who is experienced in installing work similar in design, products, and extent to scope of this Project.
 3. Manufacturer Certification: Installer shall be certified or approved by the manufacturer to install specified work.
 4. Manufacturer Training: Supervisor and installing personnel trained by technical representatives of manufacturer.
- E. The Owner, Architect and their representatives reserve the right to visit the fabricating and manufacturing facilities of the Glazing Contractor, sub-contractor or material supplier, and the testing laboratory at any time while the work is in progress.
- F. All shop and field materials as well as workmanship shall be subject to inspection by the Owner, Architect or their representatives at all times. Such inspections do not relieve the Glazing Contractor from obligations to provide the Glazed Aluminum Systems conforming to all requirements of the Contract Documents.
- G. Delegated Engineering Professional Qualifications: Professional engineer legally authorized to practice in jurisdiction where Project is located and experienced in providing engineering services of kind indicated that have resulted in work similar to this Project, and, who has a record of successful in-service performance.
- H. Manufacturers Technical Representative Qualifications: Direct employee of technical services department of manufacturer with minimum of 5 years experience in providing recommendations, observations, evaluations, and problem diagnostics. Sales representatives are not acceptable.
- I. Source Limitations: Obtain Glazed Aluminum Systems through one source from a single manufacturer or materials and components certified by the system manufacturer as compatible with other system components.
- J. Field Measurement: Wherever possible, take field measurements prior to preparation of shop drawings and fabrication, to ensure proper fitting of work. However, proceed with fabrication and coordinate installation tolerances as necessary when field measurements might delay work.
- K. Pre-Installation Conference: Before beginning work of this Section, conduct conference at Project to comply with requirements of appropriate Division 01 Sections.
1. Required Attendees:
 - a. Owner
 - b. Architect.
 - c. Contractor, including supervisor.
 - d. Glazed aluminum systems installer, including supervisor.
 - e. Installers of adjacent work, including supervisors.
 - f. Manufacturer's technical representative.
 2. Minimum Agenda:
 - a. Review Contract Document requirements.
 - b. Review approved submittals.

- c. Review installation procedures.
 - d. Review specified inspection and testing.
 - e. Review forecasted weather conditions and procedures for coping with unfavorable conditions.
 - f. Tour representative areas of required work, discuss and evaluate for compliance with Contract Documents and approved submittals, including substrate conditions, surface preparations, sequence of installation and other preparatory work performed by other installers.
3. Reports: Record discussions, including decisions and agreements reached, and prepare report.

1.04 DRAWINGS AND SPECIFICATIONS

- A. The character of these documents are intended to provide a performance type specification for the design, fabrication and installation of the Glazed Aluminum Systems. The Glazing Contractor is responsible for the engineering and design of all components as well as the fabrication, installation and performance of the systems.
- B. The architectural drawings are diagrammatic. The details shown are intended as a guide for the aesthetic and interfacing requirements of the various components of the interior and exterior wall to and with other work; details are intended to establish basic dimensions of the module and the sight lines, jointing and profiles of members. The Glazing Contractor is responsible for the design and engineering of the system within these aesthetic parameters. The drawings are not to be construed as engineering design, or adequate to meet the engineering design requirements.
- C. It is recognized that the architectural design details do not cover some conditions or modifications, which may be required. It is, however, intended that conditions not detailed shall be developed through the Glazing Contractor's shop drawings to the same level of aesthetics and in compliance with performance criteria as indicated for detailed areas and as stipulated in these specifications. The Glazing Contractor, by accepting a contract for the work, acknowledges this and agrees that the Architect shall have the final say as to all matters whether detailed or not on the architectural design details.

1.05 SUBMITTALS

- A. Submit under the provisions of Section 01330 - SUBMITTAL PROCEDURES.
- B. Prior to submitting any documents required for approval, provide an itemized list of specification requirements and architectural drawing requirements which are not embodied in the contract, or intended contract, for work of this section. In the event that there are no deviations, provide a written statement of full compliance with architectural drawings and specifications.
- C. Manufacturer's Data: Submit complete manufacturer's technical literature, including full description of all materials and hardware including weather resistance data and fabrication techniques. Submittals must also include but not be limited to:
 - 1. General:

February 27, 2026

- a. Product data for all components of the system.
 - b. Construction details and fabrication methods.
 - c. Instructions / recommendations for storage, protection and handling
 - d. Installation Instructions
 - e. Instructions / recommendations for repair and maintenance, including:
 - 1) Cleaning of the system
 - 2) Adjustment for doors, windows and other moving parts
 - 3) Detailed re-glaze procedures for all types of glass.
 - f. Certified test reports showing compliance with performance requirements where test methods are indicated.
 - g. Samples of all materials to be encompassed in the work in the size and quantity as required by the project documents.
2. Glass & Glazing
- a. Comply with submittal requirements of Section 08800 –GLAZING.
 - b. Three (3) 12" x 12" sample of each glass type, manufacturer's published data for specified glazing material and recommended glazing requirement.
 - c. Three (3) 12" long glazing gasket sample including molded corners.
 - d. Provide glass manufacturers wind and thermal stress analysis, and center deflection calculations showing that specified maximum probabilities of breakage are not exceeded.
3. Sealants & Backer Rod
- a. Comply with submittal requirements of Section 07910 – EXTERIOR WALL JOINT SEALANTS and Section 07920 - SEALANTS.
 - b. For each type of Sealant provide three (3) cured samples and four (4) copies of technical data and color selection charts.
 - c. Compatibility and Adhesion Test Reports: For each type of sealant manufacturer's report on compatibility, staining and adhesion tests.
 - d. Sealant Backer Rod (Section 07910): Four (4) 12" long samples and technical data.
4. Aluminum Finishes: (3) 2" x 4" samples of each extrusion, flat sheet or formed shapes showing color finish to be used on this project. Upon approval, submit 3 sets of 3 color sample of each finish identifying the color range variation.
5. Finished Aluminum Extrusions: (3) 12" long finished aluminum extrusion samples of the production run on all extrusion shapes involving a snap fit. Snap fits are to be designed using ½ standard tolerances.
- a. Per request only, provide (1) assembled cross shaped sample of any horizontal to vertical intersection.
6. Anchorage:

February 27, 2026

- a. Fasteners: 3 of each fastener type along with technical data, mill certificates and test reports.
 - b. Product data for anchorage, setting accessories and other related materials.
7. Product data and test reports on hardware and related accessories for each type of door and window indicated. The Architect reserves the right to require samples that show fabrication techniques and workmanship and design of hardware and accessories.
8. Samples of fire knock-out decals or markings, if required.
- D. Architect reserves the right to require submittal of fabrication samples, showing prime members, joinery, anchorage, expansion provisions, glazing, sealant and similar details, profiles and intersections.
- E. Architect reserves the right to require a full size visual mock-up on site to demonstrate fabrication techniques, workmanship, and design of hardware and accessories.
- F. Shop Drawings: Submit complete shop drawings to the Architect for approval. Shop drawings shall include full scale detail sections of every typical composite member, fully drawn, not outlined. Also show method of anchorage, joint systems, expansion provisions, glazing details, and its attachment and other pertinent details, and indicate all materials and finishes. The shop drawings shall reflect and incorporate information from the structural calculations Do not fabricate prior to acceptance.
 1. Provide shop drawings showing materials in place on the building including coordination of related and adjoining work, insert drawings and erection diagrams. Show relative layout for all adjacent walls, beams, columns slabs, ceilings, etc.
 2. Resubmittals shall include requested corrections and shall respond to previous comments. Each sheet that is revised shall bear a revision date and number. Revisions shall be flagged with a conspicuous revision symbol and number and revised detail clouded.
 3. Drawings shall include elevations, floor plans, sections and full size details.
 4. Provide isometric details of any conditions, as requested by the Architect.
 5. Drawings shall include, but not be limited to, the following information:
 - a. Dimensioned dies and profiles of individual components, and dimensions of these components to adjacent materials.
 - b. Metal thickness (including tolerances), alloy, temper and finish.
 - c. Glass make-up, thickness, finish and rating.
 - d. Glazing materials identification.
 - e. Product name and manufacturer of all sealants.
 - f. Field connections, weld sizes, anchorages, embedment length and edge distances.
 - g. Fastener manufacturer, alloy, plating, diameter, length, spacing, embedment and edge distances.

February 27, 2026

- h. Hardware, accessories and finishes.
 - i. Insert/embed drawings and erection diagrams.
 - j. Dimensioned limits of movements for all moving joints and provisions for expansion and contraction.
 - k. Joint sizes of weather seal perimeters and internal/secondary seals, including minimum/maximum joint sizes required.
 - l. Indicate size of contact area or structural bite for structural sealant glazing required to withstand the Project load requirements.
 - m. Indicate the adjoining and abutting work, which is performed by other trades.
 - n. Dimension relative layout for all adjacent walls, beams, columns, slabs and ceilings. Dimension all tolerances required or which can be accommodated.
 - o. Seal and signature of Professional Engineer currently licensed in the State of Hawaii. This shall be same engineer who signs the calculations.
- 6. Failure of a submittal to comply with the above, shall be cause for disapproval and return of documents without review, with the Glazing Contractor bearing full responsibility for any resultant delay.
 - 7. Failure to review comments or to note a noncompliance with plans and specifications shall not relieve the Glazing Contractor from his obligation to comply.
 - 8. Failure to review comments or to note a noncompliance on a given submittal shall not preclude a directive to comply on future submittals.
 - 9. Submit "As Built" Shop Drawings at completion of installation including and identifying all changes which were made to the system during the course of construction.
- G. Coordinated Calculation Submission
- 1. Provide structural calculations, sealed by a Professional Engineer currently licensed in the State of Hawaii prepared in compliance with referenced documents and these specifications.
 - 2. Where specifications and code differ, the more severe requirements shall govern. Test reports are not an acceptable substitute for calculations. Calculations shall include the following information:
 - a. Analysis for all applicable loads on framing members.
 - b. Deflection limitations of glass framing system.
 - c. Analysis for all applicable loads on anchors, including anchors embedded in concrete.
 - d. Section property computations for framing members.
 - e. Certification of conformance with structural test pressures and design pressures indicated. Include evidence of compliance by submission of product test reports with notations as required by professional engineer.

February 27, 2026

- H. Test Reports: Where manufacturer's data does not clearly indicate conformance with performance requirements submit test reports from an independent laboratory certifying performance requirements of all exterior systems.
- I. Certification: Supply certification by the manufacturer that the glazed aluminum system including finish, conform to specifications.
- J. Maintenance Manual: Submit 3 maintenance manuals for each type of system.

1.06 DELEGATED DESIGN REQUIREMENTS

- A. Delegated Engineering Requirements:
 - 1. Delegated Engineering Responsibility: Require glazed aluminum systems manufacturer to employ a delegated engineering professional to provide engineering for work of this Section to comply with concept expressed in Contract Documents.
 - 2. Engineer system to withstand structural design loads within limits and under conditions indicated, specified, or required, without material failure or permanent deformation of building structural frame or work specified.
 - 3. Inspect work as specified under PART 3 "Field Quality Control" Article
 - 4. Prepare engineering calculations, shop drawings, and other submittals and affix professional seal according to respective jurisdictional licensing regulations
- B. Delegated Engineering Assumptions:
 - 1. Allowable working stress no more than yield stress of material.
 - 2. A 1/3 increase in allowable working stress for wind or seismic loads is not acceptable.
 - 3. Glass, sealants and interior finishes shall not contribute to framing member strength, stiffness or lateral stability.
 - 4. Dead loads of glass and panels shall not extend through thermal breaks.

1.07 PERFORMANCE REQUIREMENTS

- A. Methods of fabrication and assembly (except as specified herein, or as recommended by the Architect as a consequence or result of testing), shall be at the discretion of the Contractor (subject to acceptance by the Architect) provided that the exterior and interior visible architectural effect is not changed, the work of other Contractors is not affected, and the weather tightness and strength qualities, as demonstrated by engineering calculations and measured by the results of the tests for performance requirements, are not reduced.
- B. Remedial measures, which may be necessary on the mock-ups or the building, shall maintain standards of quality and durability, and are subject to acceptance by the Architect, Owner, and their representatives.
- C. The Glazed Aluminum Systems, together with all components and sub-assemblies, shall be designed, engineered, fabricated and installed in such a manner to fully meet or exceed the minimum structural and weather resistance requirements specified herein, as demonstrated by engineering calculations and testing of mock-ups.

D. Thermal Movements

1. Thermal Movement: Fabricate exterior components from manufacturer's stock systems which have been designed to provide for expansion and contraction resulting from ambient temperature range of 120 degrees F and metal surface temperature extreme of 185 degrees F, without causing buckling stresses on glass, failure of glass, metal, or joint seals, undue stress on structural elements, damaging loads on fasteners, reduction of performance, or other detrimental effects.
2. The amount of such movement that is accommodated in the wall design shall be identified on the shop drawings and shall be accompanied by thermal calculations to address current Code.

E. Structural Properties

1. The Glazed Aluminum Systems and their anchorage and related components shall be designed with adequate strength and stiffness to withstand the loads as determined by IBC 2018 and ASCE 7.
 - a. Wind Load Criteria: As indicated on the Structural Drawings.
 - b. Design corners for simultaneous positive (inward) design pressures on both surfaces, and simultaneous negative (outward) design pressure on both surfaces.
 - c. Partial loading on one surface shall also be considered.
2. Deflection for metal members supporting glass, the performance criteria shall be as follows:
 - a. Perpendicular to the plane of the wall, net deflection of framing members shall be per AAMA TIR-A11 and shall not exceed 1/175 times span for spans up to 13' – 6" and $L/240 + 1/4$ inch for spans of 13' – 6" or greater.
 - 1) The exception to these criteria shall be that for any span with one light of glass in excess of 120" in height shall have net deflection of the framing members limited to $3/4$ inch maximum, regardless of the overall span.
 - 2) Span is defined as the distance between anchor centerline. For cantilevers, span is defined as two times the distance between anchor centerline and end of cantilever.
 - 3) Where a sealant joint occurs between a framing member and a relatively stiff building element, framing member deflection shall not exceed 1/2 of the nominal joint width, or less if required by sealant manufacturer.
 - 4) Where a framing member runs continuously past a deflecting support, the support deflection shall be considered in the analysis.
 - b. In the plane of the wall, deflection of framing members shall not exceed 1/8 inch. This includes horizontal rail sag due to dead load. Any twist of the horizontal sill members due to dead load shall be limited to 1 degree.
 - 1) Glass or Panel Bite: Bite reduced no more than 75 percent.

- 2) Glass or Panel Edge Clearance: Edge reduced no more than 25 percent, or not more than 1/8 in. Distance from glass edge to metal: no less than 1/4 in.
- c. Corner mullion in-plane deflection due to wind pressure shall be limited to 1/4 inch maximum at any time. Reduce deflection further if required for assembly and fit of component, or performance of sealant in joints.
- d. At connection points of framing members to anchors, combined movement of anchor relative to building structure, and framing member relative to anchor, shall not exceed 1/16 inch in any direction.
- e. The center deflection of the stool trim, when subjected to a 250-pound vertical concentrated load, is to be a maximum of 1/8 inch. No permanent set is allowed when load is removed.
- f. Stresses shall not exceed the allowable values established by the specifications listed in code standards. In no case shall allowable values exceed the yield stress.
- g. Sealants and interior finishes shall not be assumed to contribute to framing member strength or stiffness.
3. Performance criteria at safety loads (150% design load) for metal members supporting glass, the performance criteria shall be as follows:
 - a. For metal members supporting glass the net permanent deflection of framing members shall not exceed 1/1000 times span.
 - b. There shall be no failure or gross permanent distortion of framing members, anchors or connections.
 - c. At connection points of framing members to anchors, combined movement of anchor relative to building structure, and framing member relative to anchor, shall not exceed 1/16 inch set after load is removed.
- F. Uniform Load: A static air design load (Design Wind Load) of the value determined in the Coordinated Structural Calculations shall be applied in the positive and negative direction in accordance with ASTM E 330. There shall be no deflection in excess of L/175 of the span of any, framing member. At a structural test load equal to 1.5 times the specified design load, no glass breakage or permanent set in the framing members in excess of 0.2% of their clear spans shall occur.
- G. Seismic Designation: As indicated on the Structural Drawings.
- H. The Glazed Aluminum Systems shall perform quietly at all times and without vibration harmonics, wind whistles, noises caused by thermal movement (including "popping" or "ticking"), thermal movement transmitted to other building elements, loosening, weakening or fracturing of attachments or components of system.
- I. Anchorage
 1. Glazing Contractor shall be responsible for bracing structural steel when wall kickers induce rotation into structural members.
 2. Headed concrete studs welded to steel elements and cast-in-place with structural concrete shall have a minimum safety factor of 2.0 against ultimate failure.

February 27, 2026

3. Drilled expansion or wedge type anchors shall have a minimum safety factor of 4.0 against ultimate failure.
4. Post-Installed Anchors in Concrete: 5 according to ASTM E 488.
5. Post-Installed Anchors in Masonry: 6 according to ASTM E 488
6. The use of 1/3 increase for allowable stresses is not acceptable unless written approval by manufacturer is provided.
7. Cold-Formed Steel: As determined by delegated engineering professional consistent with engineering quality standards.
8. No chemical anchors for overhead deadload connections shall be allowed on this project.

J. Provision for Movement of the Structure

1. When the Glazed Aluminum System is attached directly to the building structure, the work shall be designed to accommodate the differential live load deflection between floors in addition to the following:
 - a. Calculated thermal expansion of the system.
 - b. Floor Live Load Vertical Deflection
 - c. Lateral Deflection
 - d. Elastic shortening of the building, as may be anticipated.
 - e. Differential foundation settlement, when relative.
 - f. Glazing Contractor shall obtain all necessary projected data and make such provision in the work as may be necessary. The amount of such movement shall be identified on Glazing Contractor's shop drawings.

K. Lateral Displacement Resistance Criteria:

1. Elastic Seismic: Withstand up to 0.65-inch parallel and perpendicular to plane of wall.
 - a. The wall shall not experience any failure in materials, sealants, anchorage of any kind and shall be fully functional both air and water tight as well as structural.
2. Inelastic Seismic: Withstand up to 2.6-inches parallel and perpendicular to plane of wall.
3. The wall may experience localized material failures, sealant may tear, framing elements may warp and buckle however no anchor shall fail nor shall any portion of the wall systems experience catastrophic failure by falling from the building.

L. Glass Strength

1. Comply with the performance requirements of Section 08800 – GLAZING
2. Glass thicknesses, when shown on Drawings, are for convenience of detailing only and are to be confirmed by subcontractor and glass manufacturer.

M. Air Infiltration

February 27, 2026

1. Air-Infiltration Rate for Fixed Windows: Not more than 0.06 cfm/ft² of fixed unit area for an inward test pressure of 6.24 psf pressure differential when tested in accordance with ASTM E283 and AAMA 101.
 2. Air-Infiltration Rate for Swing Doors: Not more than the following rate for an inward test pressure of 6.24 psf pressure differential when tested in accordance with ASTM E283 and AAMA 101.
 - a. 0.50 cfm/ft² of door area for single doors.
 - b. 1.0 cfm/ft² of door area for pair of doors.
- N. Smoke Rated Doors to be certified by Underwriters Laboratories Inc. to UL 1784 – Air Leakage Test of Door Assemblies.
- O. Water Penetration for Exterior Aluminum Windows
1. Water penetration or uncontrolled water leakage, in this specification, is defined as the appearance of uncontrolled water on the indoor face of any part of the work. "Controlled" water or condensation is defined as water which is demonstrably drained harmlessly to the exterior of the work without endangering or wetting adjacent surfaces or insulation, and not visible in the final construction.
 2. Provision shall be made to drain to the exterior face of the work, any water entering at joints, and/or any condensation occurring within the work. The system shall be designed to collect and remove all secondary water from the surrounding conditions. At insulated areas, gutter shall extend to the inside vertical plane of the insulation.
 3. No uncontrolled water penetration shall occur when the work is tested in accordance with ASTM E331 at a pressure differential of 10 psf.
 4. No uncontrolled water penetration shall occur when the wall is tested in accordance with AAMA 501.1, using a dynamic pressure equal to 10 psf.
- P. Forced-Entry Resistance: No entry shall be gained when a test load of 300 lbf is applied, as tested in accord with AAMA 1304.

1.08 WARRANTY

- A. Manufacturers Warranty: Submit written warranty (2 copies) before substantial completion signed by both the Glazed Aluminum System Manufacturer and Glazing Contractor agreeing to repair or replace defective Glazed Aluminum System materials or components that fail in materials or workmanship during the warranty period.
1. The warranty shall include extrusions, gaskets, tape, trim, fasteners, finish and all other accessories.
 2. This warranty shall cover all on-site labor to repair or replace all defective parts for the entire warranty period.
 - a. Warranty Period:
 - 1) Aluminum Window, Storefront, and Entrances: Five (5) years after date of Substantial Completion.

- b. Warranty Period for Fluoropolymer Metal Finishes: 10 years from date of Substantial Completion.
- 3. Defective materials and workmanship is hereby defined to include, but not be limited to, evidence of:
 - a. Water penetration into building interior, including excessive condensation.
 - b. Air infiltration exceeding specified limits.
 - c. Structural failure of components resulting from forces within specified limits.
 - d. Delamination of laminated glass or failure of insulated glass units.
 - e. Discoloration or fading, excessive non-uniformity, pitting, cracking, peeling, or crazing or corrosion of finish beyond normal weathering.
 - 1) "Discoloration or fading": means a change in appearance which is perceptible and objectionable as determined by the Architect when viewed visually in comparison with the original color range standards.
 - 2) "Excessive non-uniformity": means non-uniform fading during the period of the guarantee to the extent that adjacent parts have a color difference greater than the original acceptable color range.
 - 3) "Pitting, cracking, peeling, crazing or corrosion": means there shall be no pitting, surface cracks, blistering, bubbles, or non-uniform surface texture.
 - 4) or other type of corrosion discernible from a distance of 10', resulting from the natural elements in the atmosphere at the project site.
 - f. Glass breakage.
 - g. Secondary glass damage and/or damage due to failing window components.
 - h. Adhesive or cohesive failure of sealant.
 - i. Crazing on surface of non-structural sealant.
 - j. Staining of adjacent materials from sealant and/or sealant primers.
 - k. Non-structural sealant hardening beyond Shore A durometer 50 or softening below 20.
 - l. Failure of operating units and hardware to function normally.
 - m. Failure to fulfill other specified performance requirements.
- B. Unless stated otherwise in these specifications, the Glazing Contractor shall submit a warranty that states that all work is in accordance with the drawings and specifications, as amended by any changes thereto authorized by the Architect, Owner or their representatives, and free from defects in materials and workmanship and will remain weathertight for a period of 5 years from the date of final acceptance and payment of the work by the Owner. Glazing Contractor shall agree to repair or replace defective materials and workmanship to "like new condition," including such exploratory work, as necessary to determine the cause, during the guarantee period, at no additional cost to the Owner. Glazing Contractor shall include with bid copy of proposed warranty.

February 27, 2026

1. The Glazing Contractor shall be responsible for continuing corrections to defective work beyond the 5 year guarantee period if initial corrective measures were executed per the requirements as noted above but later found to be inadequate and/or not acceptable after the specified 5 year guarantee period.
- C. The warranty, the enforcement or lack of enforcement thereof, shall not deprive the Owner of other actions, rights or remedies available to him. Warranty shall be in form approved by the Owner. Warranty does not cover damage resulting from vandalism, acts of nature exceeding performance criteria, alterations, abuse of the work, failure of the supporting structure and other causes beyond the contractor's control. This warranty and its enforcement shall not deprive the Owner of other action right or remedy available to him.
- D. Glazing Contractor shall be responsible for damage to the building and furnishings occasioned by defective materials or workmanship or damage as part of repairs to the wall.

1.09 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle all wall system assemblies so as to prevent damages at all times, as per manufacturer's recommendations.
- B. All materials delivered to the site shall be stored in spaces provided where they will not be exposed to wetting or damage, and shall permit easy access to the handling of the materials. Materials shall be stored neatly, properly stacked, and protected.
- C. Deliver other materials, except bulk materials, to project site in manufacturer's unopened containers with name, brand, type, grade and color fully indicated thereon. Store bulk materials as required to avoid any deleterious effects of weather, soiling or contamination.

1.10 PROJECT CONDITIONS

- A. Coordinate as required, and be totally responsible for, the full and satisfactory compatibility and performance between all sealants used under this section and those sealants used by other trades that may be in direct contact with or adjacent to sealants in this work.
- B. Coordinate hardware locations and templates with the hardware specified in Section 08710 – FINISH HARDWARE.
- C. Take all required steps and precautions to properly isolate and prevent any degree of incompatibility between said sealants, all in strict accordance with manufacturer's specifications, recommendations and instructions.
- D. Periodically test sealants in place for adhesion, using methods recommended by sealant manufacturer. Promptly replace any sealant which does not adhere or fails to cure.
- E. Prior to commencement of work, conduct a pre-installation meeting with the Architect, Owner and their representatives, General Contractor, and any other related representative to review installation procedures, weather conditions under which work can be installed, storage, etc. Examine a sample installation of the wall which has been prepared and determine and record whether everyone

February 27, 2026

present is in agreement that the proposed installation is equal to or superior to the mock up test specimen and is likely to perform as required. Accepted control section shall be standard to which other work must confirm.

- F. Field Measurements: Check window and door openings by field measurements before fabrication and show recorded measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the work.
- G. Where field measurements cannot be made without delaying the work, guarantee opening dimensions and proceed with fabricating glazed aluminum systems without field measurements. Coordinate wall construction to ensure that actual opening dimensions correspond to guaranteed dimensions. Beginning of installation means acceptance of existing surfaces.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Single Source Responsibility: Furnish each type of product through one source from single manufacturer.
- B. Following manufacturers listed are "acceptable" only if manufacturer can evidence product compliance with requirements of Contract Documents.
 - 1. Assa Abloy
 - 2. Arcadia, Inc.
 - 3. EFCO
 - 4. ESWindow
 - 5. Oldcastle Building Envelope
 - 6. or approved equal.
- C. The basis-of-design products are based on products from the following:
 - 1. Storefront and Windows: Arcadia, Inc.
 - 2. Sliding Doors: ASSA ABLOY, Inc.

2.02 ALUMINUM

- A. Provide aluminum shapes and thicknesses as shown and as required to fulfill performance requirements. Use suitable alloy and temper for extruding with adequate structural characteristics, and suitable for finishing as specified, but not less than 22,000 psi ultimate tensile strength.
- B. Comply with the following:
 - 1. Sheet and Plate: ASTM B 209, thickness as required by delegated engineering, but not less than 3/16-inch.
 - 2. Extruded Bars, Rods, Shapes, and Tubes: ASTM B 221, thickness as required by delegated engineering, but not less than 1/8 in at any location for main frame and sash members.
 - 3. Extruded Structural Pipe and Tubes: ASTM B 429

February 27, 2026

4. Bars, Rods, and Wire: ASTM B 211
5. Welding Rods and Bare Electrodes: AWS A5.10.
- C. Thermal Barrier Material: Poured-in-place two-part polyurethane.

2.03 SLIDING ENTRY DOORS

- A. Basis-of-Design Product: (**Type SG**) Besam ASSA ABLOY VersaMax 2.0 ICU/CCU Smoke Rated Sliding Door Package as manufactured by ASSA ABLOY Entrance Systems.
 1. Type: Single Slide, Full Breakout, ICU/CCU Door System.
 - a. Operation: Manually Operated
 - b. Smoke Rated: Certified to UL 1784
 - c. Configuration: Single Slide, two equal panel unit with one operable leaf and one sidelite.
 - d. Minimum Clear Opening Width: As noted on Drawings.
 - e. Breakaway Capability: Sliding leaf and sidelite.
 - f. Mounting: Overhead header installed between jambs.
- B. Entrance Components
 1. Stile and Rail Sliding Panels and Sidelites:
 - a. Material: Extruded Aluminum, Alloy 6063-T5 or 6063-T6
 - b. Door panels shall have a minimum .125 inch (3.2 mm) structural wall thickness including adjoining perimeter frames where applicable.
 - 1) Aluminum extrusions shall allow for a factory installed, slide-in type gasket.
 - c. Door construction shall be by means of an integrated corner clip with 3/8 inch diameter all-thread through bolt from each stile.
 - 1) Face of door stiles shall be flush with adjacent rails and muntin.
 - d. Glass stops shall be .062 inch (15.8 mm) wall thickness and shall provide security function as a standard by means of a fixed non-removable exterior section with glazing to be performed from the interior only.
 - e. Vertical Stiles: Medium stile 4-inch (102mm).
 - f. Bottom Rails: 10-inch (254mm).
 - g. Smoke Gasketing: Slide-in type, replaceable smoke gasket that is capable of withstanding 400 degrees F for a minimum of 30 minutes.
 - 1) Bottom rails shall be provided with a concealed adjustable sweep gasket that is capable of withstanding exposure to 400 degrees F for a minimum of 30 minutes.

February 27, 2026

2. Door Carriers: Manufacturer's standard carrier assembly that allows vertical adjustment.
 - a. Sliding Panel Door Carriers:
 - 1) Roller Wheels: Two heavy duty Delrin roller wheels per wheel assembly, for a total of four (4) roller wheels, 1-7/16 inch (36.51 mm) diameter, per active door leaf for operation over a replaceable aluminum track. Single journal with sealed oil impregnated bearings.
 - 2) Two (2) heavy duty self-aligning anti-risers per leaf.
 3. Framing Members: Provide ICU/CCU entrances as complete assemblies. Manufacturer's standard extruded aluminum framing reinforced as required to support loads.
 - a. Vertical Jambs: 1-3/4 inch (44.5mm) by 4-1/2 inches (114.3mm).
 4. Header: Extruded aluminum header with a replaceable aluminum track, mounted between the jambs and extending full width of entrance. Header to conceal door operators, carrier assemblies, and roller track; complete with hinged access panel for service and adjustment.
 - a. Header Capacity: Capable of supporting active breakout leafs up to a maximum 220lb (100kg) per leaf.
 - b. Header Size: 4-1/2 inches wide by 4-1/2 inches high.
 - c. Gasketing: Slide-in type, replaceable mohair seals.
 - d. Header Access: Continuous hinge at top of header allows cover to swing and allow complete access to operator and internal electronic and mechanical assemblies.
 5. Anti-Static Grounding: Fabricate ICU/CCU entrances to be internally grounded to reduce static shock.
- C. Hardware: Provide Manufacturer standard hardware as required for operation indicated.
1. Breakaway arms and bottom pivot assembly shall allow panels to breakout to 90 degrees. Force to breakout sliding panel adjustable to a maximum 50lbf.
 2. Nurse Assist Magnetic catch(s) to retain breakout door and sidelite panels in the closed position.
 3. Latching hardware shall be provided as indicated.
 - a. Automatic releasing/latching, concealed magnetic bolt shall allow breakout of sidelite panel(s) when sliding panel in full open position.
 4. Door Pulls shall be provided as indicated:
 - a. Manufacturer's standard surface-mounted, 10-inch C-shaped door pull installed on both sides of active door leaves. Door pull mounting shall not decrease clear opening width.

February 27, 2026

5. Guide Track/Threshold: Manufacturer's full breakout trackless design floor mounted guide track and threshold not allowed.
6. Glazing: Type TG as specified in section 08800 Glazing

2.04 TELESCOPIC ENTRY DOORS

- A. Basis-of-Design Product: (**Type SG2**) Besam ASSA ABLOY VersaMax 2.0 Smoke Rated Telescopic Entrance. ICU/CCU, overhead concealed, full breakout, trackless telescoping, equal panel, sliding door.
 1. Type: Telescopic Sliding, Full Breakout, ICU/CCU Smoke Rated Door System.
 - a. Operation: Manually Operated
 - b. Smoke Rated: Certified to UL 1784
 - c. Configuration: Single Slide, three equal panel unit with two operable leaves and one sidelite.
 - d. Minimum Clear Opening Width: As noted on Drawings.
 - e. Breakaway Capability: Sliding leaves and sidelite.
 - f. Mounting: Overhead header installed between jambs.
- B. Entrance Components
 1. Stile and Rail Sliding Panels and Sidelites:
 - a. Material: Extruded Aluminum, Alloy 6063-T5 or 6063-T6
 - b. Door panels shall have a minimum .125 inch (3.2 mm) structural wall thickness including adjoining perimeter frames where applicable.
 - 1) Aluminum extrusions shall allow for a factory installed, slide-in type gasket.
 - c. Door construction shall be by means of an integrated corner clip with 3/8 inch diameter all-thread through bolt from each stile.
 - 1) Face of door stiles shall be flush with adjacent rails and muntin.
 - d. Glass stops shall be .062 inch (15.8 mm) wall thickness and shall provide security function as a standard by means of a fixed non-removable exterior section with glazing to be performed from the interior only.
 - e. Vertical Stiles: Medium stile 4-inch (102mm).
 - f. Bottom Rails: 10-inch (254mm).
 - g. Smoke Gasketing: Slide-in type, replaceable smoke gasket that is capable of withstanding 400 degrees F for a minimum of 30 mins..
 - 1) Bottom rails shall be provided with a concealed adjustable sweep gasket that is capable of withstanding exposure to 400 degrees F for a minimum of 30 minutes.

February 27, 2026

2. Door Carriers: Manufacturer's standard carrier assembly that allows vertical adjustment.
 - a. Sliding Panel Door Carriers:
 - 1) Roller Wheels: Two heavy duty Delrin roller wheels per wheel assembly, for a total of four (4) roller wheels, 1-7/16 inch (36.51 mm) diameter, per active door leaf for operation over a replaceable aluminum track. Single journal with sealed oil impregnated bearings.
 - 2) Two (2) heavy duty self-aligning anti-risers per leaf.
 3. Timing Transmission: Manufacturer's standard assembly that provides for a smooth operation.
 - a. Timing transmission shall sequence the opening of the first and second leaves to provide a simultaneous opening of both leaves with a smooth operation; eliminating the "grabbing" that typically occurs with telescopic doors.
 4. Framing Members: Provide ICU/CCU entrances as complete assemblies. Manufacturer's standard extruded aluminum framing reinforced as required to support loads.
 - a. Vertical Jambs: 1-3/4 inch (44.5mm) by 6 inches (154.2mm).
 5. Header: Extruded aluminum header with a replaceable aluminum track, mounted between the jambs and extending full width of entrance. Header to conceal door operators, carrier assemblies, and roller track; complete with hinged access panel for service and adjustment.
 - a. Header Capacity: Capable of supporting active breakout leafs up to a maximum 220lb (100kg) per leaf.
 - b. Header Size: 6 inches wide by 4-1/2 inches high.
 - c. Smoke Gasketing: Slide-in type, replaceable, smoke type gasket that is capable of withstanding 400° F for a minimum of 30 minutes.
 - d. Header Access: Continuous hinge at top of header allows cover to swing and allow complete access to operator and internal electronic and mechanical assemblies.
 6. Anti-Static Grounding: Fabricate ICU/CCU entrances to be internally grounded to reduce static shock.
- C. Hardware: Provide Manufacturer standard hardware as required for operation indicated.
1. Breakaway arms and bottom pivot assembly shall allow panels to breakout to 90 degrees. Force to breakout sliding panel adjustable to a maximum 50lbf.
 2. Nurse Assist Magnetic catch(s) to retain breakout door and sidelite panels in the closed position.

February 27, 2026

3. Latching hardware shall be provided as indicated.
 - a. Automatic releasing/latching, concealed magnetic bolt shall allow breakout of sidelite panel(s) when sliding panel in full open position.
4. Door Pulls shall be provided as indicated:
 - a. Manufacturer's standard surface-mounted, 10-inch C-shaped door pull installed on both sides of active door leaves. Door pull mounting shall not decrease clear opening width.
5. Guide Track/Threshold: Manufacturer's full breakout trackless design floor mounted guide track and threshold not allowed.
6. Glazing: Type TG as specified in section 08800 Glazing

2.05 ALUMINUM FIXED EXTERIOR WINDOW SYSTEM

- A. Aluminum Windows shall comply with F-AW-55. Aluminum Window shall be Thermal, dual glazed units equal to Arcadia T200 Series Heavy Commercial Fixed, in sizes and configurations as indicated and scheduled on the Drawings.
 1. Window Frame: All aluminum frames shall be fabricated from extrusions having a nominal wall thickness of 0.125-inch. Frames glazing pocket sized to accept a 1-inch infill and a 5/8-inch glass bite.
 - a. Aluminum fixed window shall have a 2-inch- deep aluminum frame with a thermal isolation separation.
 2. Extruded Accessories:
 - a. Head and Jamb Receptors: Manufacturer's thermally broken extruded aluminum two-piece receptors provided at jambs and head of fixed window.
 - 1) Main Extrusion Wall thickness: 0.125-inch
 - b. Subsill: Manufacturer' thermally broken extruded aluminum subsill
 - 1) Main Extrusion Thickness: Not less than 0.070-inch.
 - c. Gaskets: EPDM bulb type conforming to ASTM D2000 AA515 and shall be keyed into extruded grooves.
 3. Setting blocks, Edge Blocks, and Spacers: As required by manufacturer and compatible with insulated glass where required.
 4. Glazing Gaskets – Back glazing two-sided adhesive, 15 lbs./ft.³ density, polyethylene tape. Glazing wedges shall be EPDM or Santoprene.

2.06 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Surface to be finished shall be free from mechanical imperfections such as scratches, scrapes, dents and die marks. Pretreatment of the aluminum surface shall be completed in accordance with the procedures recommended by the manufacturer.

February 27, 2026

- C. Finish designations prefixed by AA conform to the system established by the Aluminum Association for designating aluminum finishes.
- D. Repair to finished surface by mechanical means (other than those specified) or by painting is strictly forbidden unless the procedure is submitted and approved by Architect (including a sample area repair).
 - 1. Material may be finished more than once provided that all specified requirements are satisfied. However, if still not acceptable, it shall be rejected.
- E. Adjacent parts of the same finish or within 6" of each other in the construction shall not vary in color by more than 1/2 the range so as the variation to be imperceptible to the naked eye under normal daylight conditions. Construct a visual mock-up or submit range samples defining the maximum variation of color that can be anticipated in the work. Samples shall be on lengths of extrusions not less than 12" and on sheet/plate/panels not less than 24" square.
- F. Submit for approval a quality control program, including procedures and processes, to assure compliance with the specified requirements.
- G. Do not ship any material that has not been inspected, tested and marked in the prescribed manner, does not fall within the prescribed color range, or has been rejected by the Architect.
- H. Anodized Finish: AAMA 611 Clear, AA-M12C22A41, Class 1, 0.018mm.
- I. Antimicrobial silver-based ion, baked-on enamel finish on all exposed surfaces including door pulls, door extrusions, rails, and header.
 - a. Antimicrobial finish must permanently suppress the growth of bacteria, algae, fungus, mold and mildew by the controlled release of silver ions that attack microbes and inhibit the growth on the treated surfaces.
 - b. Coating to be EPA registered resulting in a safe and non-toxic finish: chlorinated or synthetic chemical finishes will not be accepted.
- J. High-Performance Organic Finish for Exterior Window Frames: AA-C12C42R1x (Chemical Finish: Cleaned with inhibited chemicals; Chemical Finish: Acid-cromate-flouride-phosphate conversion coating; Organic Coating: As specified below). Prepare, pretreat and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - 1. Fluoropolymer Three-Coat Coating System: Manufacturer's three-coat, thermos-cured system composed of specially formulated inhibitive primer and Fluoropolymer color coat and clear topcoat. Both color and clear topcoats containing not less than 70% polyvinylidene fluoride resin by weight; comply with AAMA 2605.
 - 2. Resin Manufacturers: Subject to compliance with requirements, provide products containing resin by one of the following:
 - a. DuranarXL, PPG
 - b. Fluropon Premiere, Sherwin Williams.
 - c. Hylar 5000, Ausimont USA, Inc.
 - d. Kynar 5000, Elf Atochem North America, Inc.

February 27, 2026

3. Color: As selected by architect from manufacturer's full range.

2.07 GLASS AND GLAZING

- A. Comply with the requirements of Section 08800 - GLAZING

2.08 FASTENERS

- A. Any fasteners in wet or exposed areas of the wall shall be Type 316, non-magnetic stainless steel. All other fasteners shall be hot-dipped galvanized unless otherwise noted.
- B. The work shall be designed to conceal all fasteners, except where unavoidable for application of hardware. Finish exposed fasteners to match adjacent aluminum.
- C. Unexposed fasteners in dry areas shall be steel with cadmium and colored chromate plated and shall meet ASTM B 696 Class #5 and Federal Specification QQ-P-416E, Type II, Class #1. (.0005 inches thick plating).
- D. All non-stainless fasteners being used in a structural application must meet the minimum requirements of SAE J429 Grade 5.
- E. Grade 8.0 or higher fasteners, high strength bolts of non U.S. origin, or high strength bolts that are zinc plated shall not be used.
- F. Provide aluminum, nonmagnetic stainless steel, epoxy adhesive, or other materials warranted by manufacturer to be noncorrosive and compatible with aluminum window and door members, trim, hardware, anchors, and other components of window units.
- G. Where fasteners screw anchor into aluminum less than 0.125 inch thick, reinforce interior with aluminum or nonmagnetic stainless steel to receive screw threads or provide standard, noncorrosive, pressed-in, splined grommet nuts.
- H. Mill certificates and test reports for all structural grade bolts shall be submitted to the Architect, Owner and their representatives for approval prior to installation of those bolts on the job.
- I. Post-Installed Expansion Anchors: ACI 318, D.1 and ICC-ES AC193
 1. Finish: Type 316 stainless steel.
 2. Manufacturers and Products (Approved only with ICC Report)
 - a. ITW; Redhead Truebolt Wedge Anchor.
 - b. Powers; Bull Wedge Anchor.
 - c. Simpson; Strong-Bolt Wedge Anchor
- J. Threaded Concrete Anchors: Bi-Metal, 300 Series Stainless Steel head and shank fused to harden steel tapping threads and point with corrosion resistant coating with not less than 800 hours of salt-spray resistance according to ASTM B 117.
 1. Basis of Design: DeWalt.; Aggre-Gator; Hex Washer Head with Silver Stalgard finish.

2. Not Acceptable: Self-drilling self-threading fasteners, screw in plugs, and powder actuated fasteners are not permitted in concrete.
- K. Self-drilling fasteners shall be Drill-Flex as manufactured by Dewalt or Kwik-Flex as manufactured by Hilti, Inc. No substitutions accepted. Self-drilling fasteners used in wet areas shall include Dewalt's Stal-Guard finish or Hilti's Kwik-Cote finish respectively.
- L. Nuts used at expansion or moving connections shall be designed to provide a positive means of preventing disengagement. Staking of bolts, use of lock washers, or threads being deformed are not acceptable.
- M. Matched bolts, nuts and washers shall be used at all friction connections.

2.09 SEALANT MATERIALS

- A. Comply with the requirements of Section 07910 – EXTERIOR WALL JOINT SEALANTS.
- B. Glazing method shall be in general accordance with the current edition of the AAMA Metal Curtainwall Manual and GANA Glazing Manual for specified glass type.
- C. All exterior sealants shall be silicone.
- D. All internal sealants that contact the perimeter sealants must be compatible with, and adhere to, the perimeter sealant. All internal sealants used to seal glass pockets, end dams and gutters shall be silicone.
- E. Splice details shall be designed using silicone or a combination of silicone and a non curing, nonhardening, non-skimming butyl. Splice joint to be designed to separate the different sealants. Splice details to be designed to accommodate the anticipated movement of the joint.

2.10 MISCELLANEOUS MATERIALS

- A. Provide stainless steel sleeve spacers and/or suitable bearing pads as required, to insure free movement between surfaces where expansion and deflection movements are intended. Provide "Eel Slip" or "Nylatron" washers or pads of sizes and thickness (minimum 1/16 inch except 1/8 inch for Eel Slip") recommended by the manufacturer to permanently prevent "freeze up" of joints. Provide high impact polystyrene shim pads for static shims.
- B. Flashing required within the system or to join the system to adjacent construction shall be aluminum or stainless steel of acceptable design and color.
 1. ASTM A 240 stainless steel, dead-soft, not less than 0.039 in thick.
 2. Aluminum Sheet (anodized / painted), not less than 1/16 in thick. Finish to match framing members when exposed.
- C. Steel Reinforcement: Complying with ASTM A36 for structural shapes, plates, and bars; ASTM A 611 for cold-rolled sheet and strip and ASTM A 570 for hot-rolled sheet and strip.
- D. Anchors, Clips, and Window Accessories: Fabricate anchors, brackets, clips, and window accessories of aluminum, nonmagnetic stainless steel, or hot-dip zinc-coated steel complying with requirements of ASTM B633 and ASTM A 123;

February 27, 2026

- shapes and thicknesses must provide sufficient strength to withstand design pressure indicated.
- E. Thermal Barrier: The thermal barrier shall be extruded PVC or fiber-reinforced polyamide used as an applied thermal isolator unless otherwise noted.
 - F. All steel shall be given a shop prime coat of zinc chromate paint meeting FS TT-P-645. Touch up after steel welding in the field shall be in accordance with SSPC-Paint 20, zinc rich.
 - G. Baffles: Provide 30 to 40 ppi PVC coated open cell reticulated urethane foam baffles at all weep holes or vent tubes.
 - 1. Size, length and porosity to meet water and air infiltration design requirements.
 - 2. All baffles shall be mechanically restrained and compressed 30% - 50% in their final position.
 - H. Embeds shall be designed and furnished by the Glazing Contractor. Installation of embeds shall be by others per Glazing Contractor's shop drawings. Exposed surface of embeds shall be shop painted with specified primer.

2.11 FABRICATION

- A. Assembly/Fabrication Methods shall be at the discretion of the Exterior Wall Contractor (subject to acceptance by the Owner and Architect) provided that the visible architectural effect is not changed, the work of other Contractors is not affected, and the performance is not reduced.
- B. Follow conclusions and recommendations from Mock-up Testing, Consultants, Delegated Engineering, Manufacturer's written fabrication instructions, Contract Documents and Approved Submittals.
- C. General Requirements:
 - 1. Fully fabricate and finish units before shipping to Project.
 - 2. Components that are not required to be shop assembled shall be shop fitted and marked before disassembly to ensure proper assembly later at the Project site.
 - 3. Make all cutouts for penetrations at the factory, whenever possible.
 - 4. Comply with requirements indicated for materials, thicknesses, finishes, colors, designs, shapes, sizes, and details.
 - 5. Fabricate to dimensions, profiles and details indicated.
 - 6. Fabricated free of burrs, pitting, cutting edges, sharp corners, nicks, dents, and scratches.
 - 7. Reinforce components as required to receive fastener threads; Aluminum less than 1/8 in thick must be reinforced.
 - 8. Fabricate components and assemble units to comply with fire and performance requirements specified.
 - 9. Painted surfaces shall be properly prepared. Comply with "FINISHES" Section.

February 27, 2026

10. Exposed fasteners are not acceptable unless indicated or approved in writing by Contracting Officer. If approved, fastener heads to be countersunk type, finished to match adjacent surfaces.
11. Furnish flat surfaces without bulges, oil-canning, or other physical deformities.
12. Fabricate components to allow for thermal expansion and contraction, and field adjustments.
13. Provide minimum clearances and depth of glazing pockets as recommended by glass manufacturer for thickness and type of glass indicated.
14. Make provisions to drain water entering at joints and condensation occurring within wall to exterior. Provide horizontal members with continuous gutters to drain moisture to exterior through protected weep holes.
15. Accurately cut products and fit to form hairline joint connections.
16. Finish seams, joints and splices on exposed surfaces shall be imperceptible in finished work.
17. Seal joints and connections on concealed side with concealed joinery sealant.
18. Do not drill or punch holes, including weep holes, through thermal break.
19. Welds shall be of adequate strength and durability, with jointing tight, flush, smooth and clean.
20. For snap trim more than 2-1/2 in deep, fabricate for flat-head fasteners with heads painted to match finish.
21. Assemble components into complete weathertight units with and watertight joints.
22. All welding shall be done with methods recommended by the suppliers of the metals being welded.
 - a. Welds behind finished surfaces shall be done as to minimize distortion and/or discoloration on the finished side. Telegraphing of welds through a finished surface will not be accepted. Weld splatter and welding oxides on finished surfaces shall be removed by descaling and/or grinding.
 - b. Welds of gutters and end dams shall not constitute a water seal. Seal welds in areas intended to retain and channel water.
23. Provide sealant continuity notches at all metal to metal joints including welded joints.
24. Aluminum extrusions for unitized or semi-unitized designs shall be manufactured to a minimum of 1/2 industry tolerances for bow, warp, twist or angularity.

D. Glazing

1. Follow GANA Manual Guidelines and Glass Manufacturer's recommendations.
2. Comply with specification Section 08800 – Glazing.

February 27, 2026

3. Check frames for squareness and trueness. Corners must be weathertight and sills must drained to outdoors.
 4. Remove all protective coatings from framing surfaces.
 5. Clean glazing pocket before setting glass with compatible solvents.
 6. Retain setting blocks and side blocks in position. Glaze frames without inducing stress or deflection into the glass.
 7. Provide a minimum nominal glass bite of 1/2 in. Where joint movement will result in variable glass bite, increase nominal bite as required and provide 1/2 in minimum edge clearance or greater, where lateral building movement is taken by the glazing seals.
 8. Gaskets shall be vulcanized (injection molded) at corners where compatible with installation procedure. Where gasket joints occur, tightly butt end and seal with a compatible sealant.
 9. Use pre-formed custom shape extruded silicone gasket at the butt glazed vision glass. Gasket is intended to prevent silicone contact with the PVB laminate. Gasket is to adhere to wet silicone.
 10. Remove and replace stops and apply sealants as required for a complete glass installation.
- E. Glass Replacement Requirements: Capable of allowing following:
1. Glass replacement of same nominal size unit after initial construction, reusing original gaskets, without cutting of framing members or removal of interior finishes.
 2. Vision glass replaceable from either side of glazed system. At least one side, however, must be without removal of adjacent finished conditions.
- F. Design anchorage to accommodate 1 in three-dimensional maximum variation in the building structure.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. All work shall be performed by skilled workmen, especially trained and experienced in this type of work. If the Glazing Contractor chooses to subcontract the installation of work, the proposed subcontractors qualifications shall be approved by the Owner, Architect and their representatives.
- B. Bench marks for elevation and building line offset marks for alignment shall be established on each floor level by the General Contractor, who shall be responsible for their accuracy. Should any error be found in their location, the Glazing Contractor shall so notify the General Contractor in writing, and installation work shall not proceed in the affected area until the errors have been corrected.
- C. After lines and grades have been established, and before beginning installation in any area, the Glazing Contractor shall examine all parts of the structure on which the wall is to be placed. Should any conditions be found which, in his opinion, will prevent the proper execution of his work, he shall report such

condition in writing to the Architect and the General Contractor. Installation work shall not proceed in that area until such conditions are corrected or adjusted to the satisfaction of the Architect and the Glazing Contractor. Commencement of work shall constitute acceptance of surrounding conditions.

3.02 INSTALLATION/ERECTION

- A. Installation Quality Standards: In addition to standards specified elsewhere, perform work according to following, unless otherwise specified:
 - 1. Delegated engineering.
 - 2. Respective manufacturer's written instructions, specifications, and recommendations.
 - 3. Approved submittals.
 - 4. Contract Documents.
 - 5. ASTM E 2112 Standard Practice for Installation of Exterior Windows, Doors and Skylights
- B. Install wall components plumb, level, accurately aligned and accurately located in reference to column lines and floor levels.
- C. The glazed aluminum systems shall be designed to accommodate above tolerances. Provided irregularities do not exceed them, and clearances shown on approved shop drawings are maintained, all parts of the metal window wall, when completed, shall be within the following tolerances:
 - 1. Maximum misalignment between two adjoining members abutting in plane: 1/32".
 - 2. Maximum deviation from approved shop drawings in plan or elevation, including deviation from plumb, level, or dimensioned angle: 1/8" inches per 12' run in any direction, or 1/2" in any total length.
 - 3. Maximum Variation from Plumb: 1/32" every 3' non cumulative or 1/4" per 100', whichever is less.
 - 4. Longitudinal or Diagonal Warp: $\pm 1/8"$ from 10' straight edge.
 - 5. Sealant Space Between aluminum frames and Adjacent Construction: Minimum of 1/4".
- D. Provide shims, slotted holes or other means necessary for leveling, plumbing and other required adjustments.
- E. All exposed work shall be carefully matched to produce weathertight units with flush, rigid, and hairline joints. Match components to ensure continuity of line and design. All anchoring, fastening, jointing and splicing of members shall be concealed, unless noted otherwise; where bolts or screws are permitted in work exposed to view, they shall match adjacent surfaces. Exposed edges shall be finished to match face of the work.
- F. All welding shall be done by skilled mechanics qualified or licensed in accordance with local building regulations, and shall conform to the recommended practices of the American Welding Society. All welds or damage to structural steel coating must be prepared and touched up with zinc rich primer as described herein.

February 27, 2026

- G. Protect glass and other finished surfaces from damage from welding. Glass or other exposed materials with weld splatter will be rejected and must be replaced at no cost to the Owner.
- H. Anchorage of the wall to the structure shall be in strict accordance with accepted shop and/or erection drawings. Any bolts or angles to be fixed to concrete shall be supplied and installed by the Glazing Contractor; he shall be responsible for coordinating with the General Contractor and for the installation of bolts or angles in the exact position.
- I. Attachment of the glazed aluminum systems anchorage at support walls shall occur inboard of the weather line. Supporting brackets shall be designed to provide three-dimensional adjustment and accurate location. Once wall is properly positioned, all connections so designated on accepted shop drawings shall be rigidly fixed by bolting, welding or other positive mechanical means.
- J. Expansion anchorage shall be so designated to provide for thermal and building movements. Molybdenum-disulfide filled nylon ("nylatron") slip pads or washers shall be used at all thermal or dynamic anchors.
- K. Protection against galvanic and shall be provided wherever dissimilar metals are in contact. This protection shall be provided by painting the dissimilar metal surfaces with a heavy coat of zinc chromate primer or by application of an appropriate sealant or tape or other approved galvanic isolator.
- L. Protection against corrosion or electrolytic action shall be provided wherever aluminum is to be in contact with cementitious or dissimilar materials. This protection shall be provided by applying a heavy coat of bituminous paint applied to the aluminum, or other permanent separator on concealed contact surfaces of the aluminum before assembly or installation. Protection is not required in the case of aluminum in contact with galvanized steel, zinc or relatively small areas of stainless steel or nickel silver (white bronze).
 - 1. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
 - 2. Cold-applied asphalt emulsion: ASTM D 1187.
- M. Items of carbon steel, unless galvanized or scheduled for other finish, shall be thoroughly cleaned of all loose scale, filings, dirt and other foreign matter and shall be painted with zinc chromate primer, complying with Specification FS TT-P-645 and SSPC- SP12.01. Surface preparation shall meet the minimum requirements of SSPC-SP6.
- N. Install all internal condensation gutters, including end dams and end seals. Back seals and bridge seals at gutters and between other systems to aluminum framing systems shall be installed as necessary.
- O. Provide weep holes and internal passages to drain to exterior all moisture entering joints and glazing spaces, and condensation occurring within frame construction. Fasteners shall not penetrate gutters or drainage systems.

3.03 SEALANTS

February 27, 2026

- A. Comply with Section 07910 – EXTERIOR WALL JOINT SEALANTS and 07920 - SEALANTS.
- B. Sealants shall be used in strict accordance with the manufacturer's printed instructions and shall be applied only by mechanics especially trained or experienced in their use.
- C. Before commencing sealant installation, check that joint dimensions are within limits specified for the sealant and the surfaces are smooth and undamaged. Inform the Architect if joints are not suitable to receive sealant and submit proposals for rectification.
- D. Install wet seals, heel beads, toe beads, interior wet seals and structural silicone seals as indicated by architectural details.

3.04 POSTPONEMENT OF COMPLETE ENCLOSURE

- A. If so directed by the Glazing Contractor, installation of the wall shall be postponed in specific locations so as to facilitate moving material into and out of the building areas during construction.
- B. Defer glazing of openings which are obstructed during construction. Glaze such openings when obstructions are removed.

3.05 FIELD QUALITY CONTROL

- A. Pre-Testing Conference: Before beginning testing and inspections, conduct conference at Project to comply with requirements of appropriate Division 01 Sections.
- B. Field Testing and Inspections: Engage a qualified independent testing agency to perform field quality control testing and inspections to determine if installed work complies with specified requirements. Contractor to provide power, any utilities required, communication system, and manpower to perform tests.
 - 1. Required Attendees:
 - a. Owner or Owner's Representative.
 - b. Architect.
 - c. Glazing Contractor, including supervisor.
 - d. Installers of adjacent work, including supervisors.
 - e. Testing agency personnel, including supervisors.
 - f. Manufacturer's technical representative.
 - 2. Minimum Agenda:
 - a. Tour areas representative of assemblies to be tested, discuss and evaluate for compliance with Contract Documents.
 - b. Review specified inspection and testing.
 - c. Review forecasted weather conditions and procedures for coping with unfavorable conditions.
 - 3. Reports: Record discussions and decisions, prepare and certify report, and distribute.

February 27, 2026

- C. Field Tests:
 - 1. Method:
 - a. Water Penetration:
 - i. Storefront, and Window systems: ASTM E1105.
 - ii. Provide powered scaffold, hose, water supply, communication system and manpower to perform tests.
 - b. Air Infiltration: ASTM E 783
 - 2. Locations: At locations determined by the Architect.
 - 3. Quantity and Size: Minimum of one entire unit for each type of window to be selected by the Architect
 - 4. Procedure: Test at 2/3 pressure reduction of design pressures specified under PART 1 for 15 minutes at each location.
 - 5. Reports: Record testing and inspection results and prepare certified reports according to ASTM E 575 format.
- D. Re-testing and Re-inspections Due to Failures: Glazing Contractor responsible for expenses incurred, without additional cost to Owner, due to failure of work to pass testing and inspections.
- E. Delegated Engineering Field Inspection: Inspect work, including connection and attachment to building structural frame, for compliance with delegated engineering, and direct deficiencies to be corrected.
 - 1. Certification: Upon resolution of deficiencies, certify work complies with delegated engineering, authorities having jurisdiction, applicable local building codes, specified requirements, and is in keeping with generally accepted engineering practices.
 - 2. Manufacturers Field Inspection: Manufacturers technical representative shall inspect first days work and periodically inspect work to ensure installation is proceeding in accordance with manufacturer's designs, recommendations, instructions and warranty requirements. Representative shall submit written reports of each visit indicating observations, findings and conclusions of inspection.
- F. Weepage System: Mask weeps and introduce water to interior areas to demonstrate weepage performance.
 - 1. Fill gutters to average $\frac{3}{4}$ inch height and hold for 30 minutes.
 - 2. No leakage to interior spaces is allowed

3.06 PROTECTION AND CLEANING

- A. The Glazing Contractor shall remove from the installed work all mastic smears or other unsightly marks caused by his workmen, and shall be responsible for any damage to or disfigurement of the work caused at any time by other trades, as well as final cleaning and washing of glass and aluminum. The Glazing Contractor shall advise the Contractor of proper and adequate protection and cleaning procedures during remainder of construction period so that system will be without damage and deterioration at time of acceptance.

February 27, 2026

- B. Remove non-permanent labels and visible markings from glass surface.

3.07 ACCEPTANCE

- A. Installed materials, including glass, which are damaged, or which in the opinion of the Architect do not conform to the specification requirements, shall be removed and replaced with acceptable material at no additional cost to the Owner.
- B. Demonstrate proper cleaning methods and materials to Owner's maintenance personnel.
- C. Provide "As built" shop drawings and maintenance manuals per requirements of the project documents.
- D. Prior to installation of any insulation, the secondary gutter system shall be inspected for cleanliness. The insulation shall not be installed until the Architect or the Owner's representative accepts the condition of the gutter system.

END SECTION

SECTION 08584 – SECURITY WINDOWS

PART 1 - GENERAL

1.01 SUMMARY

A. This section includes:

1. Flush-Mount Security Windows: Modular Security walk-up windows.
- B. Perform and provide all labor, engineering, materials, equipment and all supplementary items necessary to complete, as indicated by the Contract Documents, the proper installation of the Security Windows. This work includes but is not limited to the following:
 1. Security Windows, including glazing, trim, and all other features.
 2. All sealants, caulking, joint fillers and gaskets for a weathertight performance of the Aluminum Windows, as specified in Section 07920 – SEALANTS.
 3. All anchorage of above components, including pre-set inserts in concrete slab (installed by others), kickers, steel or aluminum reinforcing, etc.
 4. All design, engineering calculations and shop drawings for the complete design of the Security Windows.
- C. Related Work Specified in Other Sections:
 1. Section 07920 - SEALANTS
 2. Section 08800 – GLAZING.
 3. Division 16 - ELECTRICAL

1.02 CODES AND STANDARDS

- A. The work of this section shall comply with the latest edition of the following standards. When conflicts arise between standards, the more stringent shall apply.
- B. ASTM – American Society for Testing and Materials
 1. ASTM A 240 – Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels.
 2. ASTM A 653 – Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 3. ASTM B 209 – Aluminum and Aluminum-Alloy Sheet and Plate.
 4. ASTM B 221 – Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 5. ASTM C 1036 – Standard Specification for Flat Glass.
 6. ASTM C 1048 – Heat-Treated Flat Glass--Kind HS, Kind FT Coated and Uncoated Glass.
 7. ASTM E 773 – Accelerated Weathering of Sealed Insulating Glass Units.

February 27, 2026

8. ASTM E 774 – Classification of the Durability of Sealed Insulating Glass units.
9. ASTM F 1233 – Security Glazing Materials And Systems.
- C. SSPC-Society for Protecting Coatings.
 1. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic")
- D. AWS – American Welding Society
 2. AWS D1.2, Structural Welding Code – Aluminum
- E. GANA – Glass Association of North America
 1. Glazing Manual
 2. Glazing Sealing Systems Manual
- F. UL – Underwriters Laboratories
 1. UL 752 – Bullet-Resistant Equipment
- L. IBC 2018 with Kauai County amendments

1.03 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company with not less than 10 years' experience in manufacturing products similar to scope of this Project with a record of successful in-service performance.
- B. Engage a single firm to assume undivided responsibility for fabrication, installation and total coordination of all components of the Work as described above and herein. This firm must demonstrate not less than 10 years consecutive successful experience in fabrication and installation of work similar to the work of this project. Individual experience does not qualify.
- C. The subcontracting of any work included hereunder is specifically prohibited, except for that which may be accepted by the Architect, Owner or their representatives in writing 10 days prior to award of the contract.
- D. The Owner, Architect and their representatives reserve the right to visit the fabricating and manufacturing facilities of the Glazing Contractor, sub-contractor or material supplier, and the testing laboratory at any time while the work is in progress.
- E. All shop and field materials as well as workmanship shall be subject to inspection by the Owner, Architect or their representatives at all times. Such inspections do not relieve the Glazing Contractor from obligations to provide all requirements of the Contract Documents.
- F. Manufacturers Technical Representative Qualifications: Direct employee of technical services department of manufacturer with minimum of 5 years' experience in providing recommendations, observations, evaluations, and problem diagnostics. Sales representatives are not acceptable.
- G. Manufacturer's representative shall periodically inspect material and installation to insure installation is proceeding in accordance with manufacturer's recommendations and warranty requirements. Representative shall submit a

- written report of each visit indicating observations, findings and conclusions of inspection.
- H. Source Limitations: Obtain Security Window through one source from a single manufacturer or materials and components certified by the system manufacturer as compatible with other system components.
 - I. Field Measurement: Wherever possible, take field measurements prior to preparation of shop drawings and fabrication, to ensure proper fitting of work. However, proceed with fabrication and coordinate installation tolerances as necessary when field measurements might delay work.

1.04 DRAWINGS AND SPECIFICATIONS

- A. The character of these documents are intended to provide a performance type specification for the design, fabrication and installation of the Security Windows Systems. The Glazing Contractor is responsible for the engineering and design of all components as well as the fabrication, installation and performance of the systems.
- B. The architectural drawings are diagrammatic. The details shown are intended as a guide for the aesthetic and interfacing requirements of the various components of the exterior wall to and with other work; details are intended to establish basic dimensions of the module and the sight lines, jointing and profiles of members. The Glazing Contractor is responsible for the design and engineering of the system within these aesthetic parameters. The drawings are not to be construed as engineering design, or adequate to meet the engineering design requirements.
- C. It is recognized that the architectural design details do not cover some conditions or modifications, which may be required. It is, however, intended that conditions not detailed shall be developed through the Glazing Contractor's shop drawings to the same level of aesthetics and in compliance with performance criteria as indicated for detailed areas and as stipulated in these specifications. The Glazing Contractor, by accepting a contract for the work, acknowledges this and agrees that the Architect shall have the final say as to all matters whether detailed or not on the architectural design details.

1.05 SUBMITTALS

- A. Submit under the provisions of Section 01330 – SUBMITTAL PROCEDURES.
- B. Manufacturer's Data: Submit complete manufacturer's technical literature, including full description of all materials and hardware including weather resistance data and fabrication techniques. Submittals must also include but not be limited to:
 - 1. Product Data: Submit manufacturer's product data, including materials, components, fabrication, finish, and installation instructions
 - 2. Shop Drawings: Submit manufacturer's shop drawings, including plans, elevations, sections, and details, indicating dimensions, tolerances, materials, fabrication, glazing, fasteners, hardware, finish, electrical wiring diagrams, options, and accessories.
 - 3. Samples: Submit samples of all materials to be encompassed in the work in the size and quantity as required by the project documents.

February 27, 2026

4. Manufacturer's Certification: Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application.
5. Manufacturer's Project References: Submit list of successfully completed security window projects, including project name and location, name of architect, and type and quantity of security windows installed.
6. Operation and Maintenance Manual: Submit manufacturer's operation and maintenance manual, including operation, maintenance, adjustment, and cleaning instructions, trouble shooting guide, parts list, and electrical wiring diagrams.
7. Warranty: Submit manufacturer's standard warranty

1.06 DELIVERY, STORAGE AND HANDLING

- A. Quality Standard: AAMA CW-10
- B. Deliver, store and handle all wall system assemblies so as to prevent damages at all times, as per manufacturer's recommendations.
- C. All materials delivered to the site shall be stored in spaces provided in the building, where they will not be exposed to wetting or damage, and shall permit easy access to the handling of the materials. Materials shall be stored neatly, properly stacked, and protected.
- D. Protect materials and finish from damage during handling and installation .

1.07 WARRANTY

- A. Manufacturer's Warranty: Submit written warranty (2 copies) before Substantial Completion signed by both the Window Manufacturer and Glazing Contractor agreeing to repair or replace defective Aluminum Window materials or components that fail in materials or workmanship during the warranty period.
 1. The warranty shall include extrusions, gaskets, tape, trim, fasteners, finish and all other accessories.
 2. This warranty shall cover all on-site labor to repair or replace all defective parts for the entire warranty period.
 - a. Warranty Period: 2 years after the Substantial Completion date.
 - b. Warranty Period for Anodic Metal Finishes: 5 years from the Substantial Completion date.
 3. Defective materials and workmanship is hereby defined to include, but not be limited to, evidence of:
 - a. Air infiltration exceeding specified limits.
 - b. Structural failure of components resulting from forces within specified limits.
 - c. Discoloration or fading, excessive non-uniformity, pitting, cracking, peeling, or crazing or corrosion of finish beyond normal weathering.
 - 1) "Discoloration or fading": means a change in appearance which is perceptible and objectionable as determined by the Architect

when viewed visually in comparison with the original color range standards.

- 2) "Excessive non-uniformity": means non-uniform fading during the period of the guarantee to the extent that adjacent parts have a color difference greater than the original acceptable color range.
- 3) "Pitting, cracking, peeling, crazing or corrosion": means there shall be no pitting, surface cracks, blistering, bubbles, or non-uniform surface texture.
- 4) or other type of corrosion discernible from a distance of 10', resulting from the natural elements in the atmosphere at the project site.

- d. Glass breakage.
- e. Secondary glass damage and/or damage due to failing window components.
- f. Adhesive or cohesive failure of sealant.
- g. Crazing on surface of non-structural sealant.
- h. Staining of adjacent materials from sealant and/or sealant primers.
- i. Non-structural sealant hardening beyond Shore A durometer 50 or softening below 20.
- j. Failure of operating units and hardware to function normally.
- k. Failure to fulfill other specified performance requirements.

B. Unless stated otherwise in these specifications, the Glazing Contractor shall submit a warranty that states that all work is in accordance with the drawings and specifications, as amended by any changes thereto authorized by the Architect and free from defects in materials and workmanship and will remain weathertight for a period of 2 years from the date of Substantial Completion and payment of the work by the Owner. Glazing Contractor shall agree to repair or replace defective materials and workmanship to "like new condition," including such exploratory work, as necessary to determine the cause, during the guarantee period, at no additional cost to the Owner. Glazing Contractor shall include with bid copy of proposed warranty.

1. The Glazing Contractor shall be responsible for continuing corrections to defective work beyond the 2-year warranty period if initial corrective measures were executed per the requirements as noted above but later found to be inadequate and/or not acceptable after the specified 2-year warranty period.

C. The warranty, the enforcement or lack of enforcement thereof, shall not deprive the Owner of other actions, rights or remedies available to the Owner. Warranty shall be in form approved by the Owner. Warranty does not cover damage resulting from vandalism, acts of nature exceeding performance criteria, alterations, abuse of the work, failure of the supporting structure and other causes beyond the contractor's control.

February 27, 2026

- D. Glazing Contractor shall be responsible for damage to the building and furnishings occasioned by defective materials or workmanship or damage as part of repairs to the wall or counter.

1.08 PROJECT CONDITIONS

- A. Coordinate as required, and be totally responsible for, the full and satisfactory compatibility and performance between all sealants used under this section and those sealants used by other trades that may be in direct contact with or adjacent to sealants in this work.
- B. Take all required steps and precautions to properly isolate and prevent any degree of incompatibility between said sealants, all in strict accordance with manufacturer's specifications, recommendations and instructions.
- C. Periodically test sealants in place for adhesion, using methods recommended by sealant manufacturer. Promptly replace any sealant which does not adhere or fails to cure.
- D. Field Measurements: Check window and door openings by field measurements before fabrication and show recorded measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the work.
- E. Where field measurements cannot be made without delaying the work, guarantee opening dimensions and proceed with fabricating Security Window systems without field measurements. Coordinate wall construction to ensure that actual opening dimensions correspond to guaranteed dimensions. Beginning of installation means acceptance of existing surfaces.

PART 2 - PRODUCTS

2.01 MANUFACTURER'S

- A. Single Source Responsibility: Furnish each type of product through one source from single manufacturer.
- B. The basis-of-design products for Security windows are based on 600 Series Flush-Mount Modular Security Walk-up Transaction Window as manufactured by Ready Access Inc.

2.02 SECURITY WINDOWS

- A. Window Dimensions: As indicated on the drawings.
- B. Overall height with tray: As indicated on the drawings.
- C. Service Panel Operation: None
- D. Service Panel Type: Fixed
- E. Frame: Extruded aluminum, ASTM B 221, Alloy 6063-T6.
- F. Aluminum Sheet: ASTM B 209, Alloy 5005-AQ-H34.
- G. Galvanized Steel Sheet: ASTM A 653, G90.
- H. Speaker: Passive speaker hole. No draft metal speaker hole cover.

February 27, 2026

1. Finish: Aluminum satin anodized.
- I. Deal Tray: 12"wide x 1 7/8"deep Drop in Non-Ricochet Deal Tray – drops into counter.
- J. Glazing: 3/4-inch GE Lexgard MP-750 Laminate. 3-ply clear, extruded Lexan polycarbonate and acrylic laminate with Margard surface. Bullet-resistant security glazing, ASTM F 1233. UL 752, Level 1.
- K. Sealant: See Section 07920 - SEALANTS

2.03 FASTENERS

- A. Any fasteners in wet areas of the wall shall be series 300, non-magnetic stainless steel.
- B. The work shall be designed to conceal all fasteners, except where unavoidable for application of hardware. In this case, exposed fasteners shall be series 300, non-magnetic stainless steel unless approved otherwise. Finish exposed fasteners to match adjacent aluminum.
- C. Provide aluminum, nonmagnetic stainless steel, epoxy adhesive, or other materials warranted by manufacturer to be noncorrosive and compatible with aluminum storefront members, trim, hardware, anchors, and other components of window units.
- D. Where fasteners screw anchor into aluminum less than 0.125-inch-thick, reinforce interior with aluminum or nonmagnetic stainless steel to receive screw threads or provide standard, noncorrosive, pressed-in, splined grommet nuts.

2.04 FINISH

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Surface to be finished shall be free from mechanical imperfections such as scratches, scrapes, dents and die marks. Pretreatment of the aluminum surface shall be completed in accordance with the procedures recommended by the manufacturer.
- C. Apply coatings uniformly to coating manufacturer's recommended thicknesses so that there are no streaks, runs, sags, absence of coating, blisters, "orange peel" or similar imperfections.
- D. Concealed members may be mill finish, providing that they cannot be seen through the glass, do not contact any structural silicone or are not continually exposed to water immersion.
- E. Finish designations prefixed by AA conform to the system established by the Aluminum Association for designating aluminum finishes.
- F. Repair to finished surface by mechanical means (other than those specified) or by painting is strictly forbidden unless the procedure is submitted and approved by Architect (including a sample area repair).
 1. Material may be finished more than once provided that all specified requirements are satisfied. However, if still not acceptable, it shall be rejected.

February 27, 2026

- G. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- H. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- I. Submit for approval a quality control program, including procedures and processes, to assure compliance with the specified requirements.
- J. Do not ship any material that has not been inspected, tested and marked in the prescribed manner, does not fall within the prescribed color range, or has been rejected by the Architect.
- K. Aluminum Finish: Anodized, Clear, AA-M10-C12-C22-A31, ASTM B 680

2.05 FABRICATION

- A. Fabrication Quality Standards: In addition to standards specified elsewhere, perform work according to following, unless otherwise specified:
 - 1. ANSI/AAMA 402.9
 - 2. AAMA/WDMA/CSA 101/I.S.2/A440
 - 3. GANA Manual and Glass Manufacturer's recommendations.
 - 4. Approved submittals and Contract Documents
- B. General Requirements
 - 1. Fully fabricate and finish units before shipping to Project.
 - 2. Make all cutouts for penetrations at the factory, whenever possible
 - 3. All parts of the Aluminum Windows shall be of the materials, design, sizes and thicknesses shown or called for on the drawings and/or herein specified. Methods of fabrication and assembly however, unless otherwise specifically stated, shall be at the discretion of the manufacturer subject to acceptance by the Architect.
 - 4. Fabricate to dimensions, profiles and details indicated.
 - 5. Fabricated free of burrs, pitting, cutting edges, sharp corners, nicks, dents, and scratches.
 - 6. Reinforce components as required to receive fastener threads; Aluminum less than 1/8 in thick must be reinforced.
 - 7. Fabricate components and assemble units to comply with fire and performance requirements specified.
 - 8. Exposed fasteners are not acceptable unless indicated or approved in writing by Architect. If approved, fastener heads to be countersunk type, finished to match adjacent surfaces.
 - 9. Furnish flat surfaces without bulges, oil-canning, or other physical deformities.

February 27, 2026

10. Fabricate components to allow for thermal expansion and contraction, and field adjustments.
 11. Provide minimum clearances and depth of glazing pockets as recommended by glass manufacturer for thickness and type of glass indicated.
 12. Accurately cut products and fit to form hairline joint connections.
 13. Finish seams, joints and splices on exposed surfaces shall be imperceptible in finished work.
 14. Seal joints and connections on concealed side with concealed joinery sealant.
 15. Provide sealant continuity notches at all metal to metal joints including welded joints.
 16. Aluminum extrusions for unitized or semi-unitized designs shall be manufactured to a minimum of 1/2 industry tolerances for bow, warp, twist or angularity.
- C. Changes of plane, parallel or transverse to longitudinal axis shall be accomplished as detailed on the drawings in the factory wherever practical and with a minimum of field fabrication.
- D. All miter and 90° joints are to be made in a factory environment.
- E. Protection against galvanic action shall be provided wherever dissimilar metals are in contact by painting the dissimilar metal surfaces with a heavy coat of zinc chromate primer (Specification FS TT-P-645, SSPC-SP6 and SSPC- SP12.01) or by application of an appropriate sealant or tape or other approved galvanic isolator.
- F. All welding shall be in accord with pertinent recommendations of the American Welding Society and shall be done with electrodes and/or by methods recommended by the suppliers of the metals being welded. Type, size and spacings of welds shall be as shown on approved shop drawings and structural calculations. Paint all field welds with zinc rich primer. Welds shall be of adequate strength and durability, with jointing tight, flush, smooth and clean.
- G. Welds behind finished surfaces shall be done as to minimize distortion and/or discoloration on the finished side. Weld splatter and welding oxides on finished surfaces shall be removed by descaling and/or grinding. Telegraphing of welds through a finished surface will not be accepted.
- H. Glazing
1. Follow GANA Manual Guidelines and Glass Manufacturer's recommendations.
 2. Check frames for squareness and trueness. Corners must be weathertight and sills must drain to outdoors.
 3. Remove all protective coatings from framing surfaces.
 4. Clean glazing pocket before setting glass with compatible solvents.
 5. Retain setting blocks and side blocks in position. Glaze frames without inducing stress or deflection into the glass.

February 27, 2026

6. Remove and replace stops and apply sealants as required for a complete glass installation.

2.06 SHOP ASSEMBLY

- A. To the fullest extent practicable, fabrication, glazing and assembly shall be executed under factory conditions, and in compliance with the standards and procedures of the appropriate manufacturers. Components or parts that are not required to be shop assembled shall be shop fitted and marked before disassembly to ensure proper assembly later at the building site.
- B. Any site assemblies shall be approved by the Architect, Owner and their representatives.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Site Verification of Conditions: Verify substrate conditions (which have been previously installed under other sections) are acceptable for product installation in accordance with manufacturer's instructions. Verify openings are sized to receive units and sill plate is level in accordance with manufacturer's acceptable tolerances. Verify field measurements for multi-sliding door installation.

3.02 PREPARATION

- A. General: Surfaces shall have no conditions which would cause faulty work or failures, or result in potentially defective installation.
- B. Isolate and prevent any degree of incompatibility between all sealants used under this section and those sealants used by other trades that may be in direct contact with or adjacent to sealants in this work.
- C. Adjacent Surfaces Protection: Protect adjacent work areas and finish surfaces from damage during product installation.

3.03 INSTALLATION

- A. Installation Quality Standards: In addition to standards specified elsewhere, perform work according to following, unless otherwise specified:
 1. Delegated engineering.
 2. Respective manufacturer's written instructions, specifications, and recommendations.
 3. Approved submittals.
 4. Contract Documents.
- B. Install component parts level, plumb and true to line with uniform joints. Do not use defective parts (warped, twisted, bowed, dented or abraded). Secure to structure with non-staining non-corrosive shims, anchors, fasteners, spacers and fillers. Provide structural galvanized steel vertical stiffener members where required by height or design conditions. Use care in erection so as not to mar, abrade or stain finished surfaces. Where aluminum is to be placed in contact with

steel, concrete, concrete block and other dissimilar surfaces, back paint the aluminum before erection with an acceptable bituminous paint.

- C. Install joints with concealed splice plates in aluminum cladding when single piece fabrication is not possible. Apply two continuous strips of non-curing sealant tape on either side of the joint capable of providing a watertight seal.
- D. All exposed work shall be carefully matched to produce units with flush, rigid, and hairline joints. Match components to ensure continuity of line and design. All anchoring, fastening, jointing and splicing of members shall be concealed, unless noted otherwise; where bolts or screws are permitted in work exposed to view, they shall match adjacent surfaces. Exposed edges shall be finished to match face of the work.
- E. Anchorage of the window to the structure shall be in strict accordance with accepted shop and/or erection drawings and structural calculations. Any bolts or angles to be fixed to concrete shall be supplied and installed by the Glazing Contractor; he shall be responsible for coordinating with the General Contractor and for the installation of bolts or angles in the exact position
- F. Anchors: Anchors of the sizes and shapes required shall be provided for securing aluminum frames to adjacent construction. Anchors shall be placed near top and bottom of each jamb and at intermediate points as indicated on approved shop drawings.
- G. Dissimilar Materials: Provide separation of aluminum materials and other corrodible surfaces from sources of corrosion or electrolytic action contact points by complying with AAMA 101, Appendix, titled "Dissimilar Materials".

3.04 FIELD QUALITY CONTROL

- A. Pre-Testing Conference: Before beginning testing and inspections, conduct conference at Project to comply with requirements of appropriate Division 01 Sections.
- B. Delegated Engineering Field Inspection: Inspect work, including connection and attachment to building structural frame, for compliance with delegated engineering, and direct deficiencies to be corrected.
 - 1. Certification: Upon resolution of deficiencies, certify work complies with delegated engineering, authorities having jurisdiction, applicable local building codes, specified requirements, and is in keeping with generally accepted engineering practices.
 - 2. Manufacturers Field Inspection: Manufacturers technical representative shall inspect first days work and periodically inspect work to ensure installation is proceeding in accordance with manufacturer's designs, recommendations, instructions and warranty requirements. Representative shall submit written reports of each visit indicating observations, findings and conclusions of inspection.

3.05 PROTECTION

- A. The Glazing Contractor shall remove from the installed work all mastic smears or other unsightly marks caused by his workmen, and shall be responsible for any damage to or disfigurement of the work caused at any time by other trades, as well as final cleaning and washing of glass and aluminum. The Glazing Contractor

February 27, 2026

shall advise the Contractor of proper and adequate protection and cleaning procedures during remainder of construction period so that system will be without damage and deterioration at time of acceptance.

- B. Remove non-permanent labels and visible markings from glass surface.

3.06 CLEAN

- A. Clean and maintain aluminum surfaces in accordance with AAMA 610.1, "Cleaning and Maintenance of Painted Aluminum Extrusions and Curtain Wall Panels".
- B. Clean surfaces promptly after installation, exercising care to avoid damage to protective finishes. Remove temporary coverings and protection from adjacent surfaces. Remove excess glazing and sealant compounds, dirt and other substances. Repair or replace damaged installed materials.
- C. After completion of all other work in the vicinity of the aluminum window, remove all masking and/or other covering used to protect the work and thoroughly clean the aluminum surfaces with plain water or a commercial product as recommended by the manufacturer. Do not use abrasive cleaning agents.

3.07 ACCEPTANCE

- A. Installed materials, including glass, which are damaged, or which in the opinion of the Architect do not conform to the specification requirements, shall be removed and replaced with acceptable material at no additional cost to the Owner.
- B. Demonstrate proper cleaning methods and materials to maintenance personnel.
- C. Provide "As built" shop drawings and maintenance manuals per requirements of the project documents.
- D. Remove and replace units and/or materials which are damaged, do not comply with Contract Documents, or in the opinion of the Architect, do not conform to the Specification Requirements. Eliminate evidence of replacement, and replace material damaged in the process.
- E. Glass breakage during the guarantee period will be considered a form of faulty material or workmanship

END OF SECTION

SECTION 08710 – FINISH HARDWARE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes commercial door hardware for the following:
 - 1. Swinging doors.
 - 2. Sliding doors.
 - 3. Other doors to the extent indicated.
- B. Door hardware includes, but is not necessarily limited to, the following:
 - 1. Mechanical door hardware.
 - 2. Electromechanical door hardware.
 - 3. Cylinders specified for doors in other sections.
- C. Related Sections:
 - 1. Section 08110 – STEEL DOORS AND FRAMES
 - 2. Section 08210 – WOOD DOORS
 - 3. Section 08330 – OVERHEAD COILING DOORS
 - 4. Section 08340 – BEHAVIORAL HEALTH DOORS AND FRAMES
 - 5. Section 08460 – SLIDING AUTOMATIC ENTRANCE DOORS
- D. year adopted by the Authority Having Jurisdiction.
 - 1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
 - 2. ICC/IBC - International Building Code.
 - 3. NFPA 70 - National Electrical Code.
 - 4. NFPA 80 - Fire Doors and Windows.
 - 5. NFPA 101 - Life Safety Code.
 - 6. NFPA 105 - Installation of Smoke Door Assemblies.
 - 7. State Building Codes, Local Amendments.
- E. Standards: All hardware specified herein shall comply with the following industry standards:
 - 1. ANSI/BHMA Certified Product Standards - A156 Series
 - 2. UL10C – Positive Pressure Fire Tests of Door Assemblies

1.03 SUBMITTALS

- A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.
- B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
 - 1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
 - 2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
 - 3. Content: Include the following information:
 - a. Type, style, function, size, label, hand, and finish of each door hardware item.
 - b. Manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
 - e. Explanation of abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for door hardware.
 - g. Door and frame sizes and materials.
 - h. Warranty information for each product.
 - 4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
- C. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.
- D. Informational Submittals:

1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.
- E. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.

1.04 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.
- B. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- C. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.
- D. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.
 1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
- E. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.
- F. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:
 1. Function of building, purpose of each area and degree of security required.
 2. Plans for existing and future key system expansion.
 3. Requirements for key control storage and software.
 4. Installation of permanent keys, cylinder cores and software.
 5. Address and requirements for delivery of keys.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.
- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.06 COORDINATION

- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.
- B. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.07 WARRANTY

- A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
 - 1. Structural failures including excessive deflection, cracking, or breakage.
 - 2. Faulty operation of the hardware.
 - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 4. Electrical component defects and failures within the systems operation.
- C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.
- D. Special Warranty Periods:
 - 1. Ten years for mortise locks and latches.
 - 2. Seven years for heavy duty cylindrical (bored) locks and latches.

February 27, 2026

3. Five years for exit hardware.
4. Twenty five years for manual overhead door closer bodies.
5. Two years for electromechanical door hardware.

1.08 MAINTENANCE SERVICE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.01 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.
- B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:
 1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
- C. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.02 HANGING DEVICES

- A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.
 1. Quantity: Provide the following hinge quantity:
 - a. Two Hinges: For doors with heights up to 60 inches.
 - b. Three Hinges: For doors with heights 61 to 90 inches.
 - c. Four Hinges: For doors with heights 91 to 120 inches.
 - d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.
 2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:

- a. Widths up to 3'0": 4-1/2" standard or heavy weight as specified.
 - b. Sizes from 3'1" to 4'0": 5" standard or heavy weight as specified.
 3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
 - a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
 - b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
 4. Hinge Options: Comply with the following:
 - a. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.
 5. Manufacturers:
 - a. McKinney Products; ASSA ABLOY Architectural Door Accessories (MCK) - TA Series.
 - b. Hager Companies (HAG) - CB Series.
 - c. Stanley Hardware (STA) - CB Series.
- B. Sliding Door Hardware: Hardware is to be of type and design as specified and should comply with ANSI/BHMA A156.14.
 1. Sliding Door Hardware: Provide complete sets consisting of track, hangers, stops, bumpers, floor channel, guides, and accessories indicated.
 2. Manufacturers:
 - a. Accurate Lock & Hardware (ACU)
 - b. Pemko Products; ASSA ABLOY Architectural Door Accessories (PEM).
 - c. Stanley Hardware (STA).

2.03 DOOR OPERATING TRIM

- A. Flush Bolts and Surface Bolts: ANSI/BHMA A156.3 and A156.16, Grade 1, certified.
 1. Flush bolts to be furnished with top rod of sufficient length to allow bolt retraction device location approximately six feet from the floor.
 2. Furnish dust proof strikes for bottom bolts.
 3. Surface bolts to be minimum 8" in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable.

February 27, 2026

4. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.
5. Manufacturers:
 - a. Door Controls International (DCI).
 - b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (ROC).
 - c. Trimco (TRI).
- B. Coordinators: ANSI/BHMA A156.3 certified door coordinators consisting of active-leaf, hold-open lever and inactive-leaf release trigger. Model as indicated in hardware sets.
 1. Manufacturers:
 - a. Door Controls International (DCI).
 - b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (ROC).
 - c. Trimco (TRI).
- C. Door Push Plates and Pulls: ANSI/BHMA A156.6 certified door pushes and pulls of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.
 1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
 2. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.
 3. Manufacturers:
 - a. Rockwood Products; ASSA ABLOY Architectural Door Accessories (ROC).
 - b. Hiawatha, Inc. (HIA).
 - c. Trimco (TRIN).

2.04 CYLINDERS AND KEYING

- A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.
- B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.
- C. Cylinders: Original manufacturer cylinders complying with the following:
 1. Mortise Type: Threaded cylinders with rings and cams to suit hardware application.
 2. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.

February 27, 2026

3. Bored-Lock Type: Cylinders with tailpieces to suit locks.
 4. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
 5. Keyway: Manufacturer's Standard.
- D. Keying System: Each type of lock and cylinders to be factory keyed.
1. Conduct specified "Keying Conference" to define and document keying system instructions and requirements.
 2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
 3. New System: Key locks to a new key system as directed by the Owner.
- E. Key Quantity: Provide the following minimum number of keys:
1. Change Keys per Cylinder: Two (2)
 2. Master Keys (per Master Key Level/Group): Five (5).
 3. Construction Keys (where required): Ten (10).
- F. Construction Keying: Provide construction master keyed cylinders.
- G. Key Registration List (Bitting List):
1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
 2. Provide transcript list in writing or electronic file as directed by the Owner.
- H. Key Control Cabinet: Provide a key control system including envelopes, labels, and tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet. Key control cabinet shall have expansion capacity of 150% of the number of locks required for the project.
1. Manufacturers:
 - a. Lund Equipment (LUN).
 - b. MMF Industries (MMF).
 - c. Telkee (TEL).

2.05 MECHANICAL LOCKS AND LATCHING DEVICES

- A. Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 certified. Locksets are to be manufactured with a corrosion resistant steel case and be field-reversible for handing without disassembly of the lock body.
1. Manufacturers:
 - a. Corbin Russwin Hardware (RUS) – ML2000 Series.
 - b. Sargent Manufacturing (SAR) – 8200 Series.
 - c. Yale Locks and Hardware (YAL) – 8800FL Series.
- B. Tubular Locksets:

February 27, 2026

1. Standard tubular locksets designed to fit ANSI standard 161 door prep without additional through-bolt preps.
2. Manufacturers:
 - a. Corbin Russwin Hardware (RUS) - TL3700 Series.
 - b. Sargent Manufacturing (SAR) – DL Series.
 - c. Yale Locks and Hardware (YAL) - RL Series.

2.06 AUXILIARY LOCKS

- A. Sliding Door Privacy Lock: Provide field reversible units with emergency release key and ADA options as specified.
 1. Manufacturers:
 - a. Accurate Lock & Hardware (ACU)

2.07 LOCK AND LATCH STRIKES

- A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
 1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
 2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
 3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
 4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.
- B. Standards: Comply with the following:
 1. Strikes for Mortise Locks and Latches: BHMA A156.13.
 2. Strikes for Bored Locks and Latches: BHMA A156.2.
 3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
 4. Dustproof Strikes: BHMA A156.16.

2.08 CONVENTIONAL EXIT DEVICES

- A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:
 1. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.
 2. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit

Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer's catalog and template book for specific requirements.

3. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.
 4. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.
 5. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.
 - a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
 - b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.
 6. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.
 7. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2" wide stiles.
 8. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.
 9. Rail Sizing: Provide exit device rails factory sized for proper door width application.
 10. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.
- B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 certified panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Exit device latch to be stainless steel, pullman type, with deadlock feature.
1. Manufacturers:
 - a. Corbin Russwin Hardware (RUS) - ED4000 / ED5000 Series.
 - b. Sargent Manufacturing (SAR) - 80 Series.
 - c. Von Duprin (VON) - 35A/98 XP Series.

2.09 DOOR CLOSERS

- A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.
 2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
 3. Cycle Testing: Provide closers which have surpassed 15 million cycles in a test witnessed and verified by UL.
 4. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.
 5. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
 6. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
 7. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.
- B. Door Closers, Surface Mounted (Heavy Duty): ANSI/BHMA A156.4, Grade 1 surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control. Provide non-handed units standard.
1. Manufacturers:
 - a. Sargent Manufacturing (SAR) - 1431 Series
 - b. Sargent Manufacturing (SAR) - 351 Series.
 - c. Norton Door Controls (NOR) - 7500 Series.
- C. Door Closers, Surface Mounted (Commercial Duty): ANSI/BHMA 156.4, Grade 1 certified surface mounted, institutional grade door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck, closing sweep, and latch speed control valves. Provide non-handed units standard.
1. Manufacturers:
 - a. Corbin Russwin Hardware (RUS) - DC6000 Series.
 - b. Norton Door Controls (NOR) - 8500 Series.
 - c. Sargent Manufacturing (SAR) - 1431 Series.

2.10 SURFACE MOUNTED CLOSER HOLDERS

- A. Closer Holder Release Devices: ANSI A156.15 certified closer holder release devices designed to hold open fire or smoke rated doors until interruption of signal from fire alarm, smoke detector or remote release switch. . Pull side, push side, or double egress mounting applications available with non-handed track and closer body and dual voltage input (24V/120V). Voltage to be 24VDC unless otherwise specified. Where optional detector is required, provide integral photo electric type with LED indicator. Auxiliary door stops are required at hold open point.
 - 1. Manufacturers:
 - a. Norton Door Controls (NOR) - 7700PT(D) Series.
 - b. Sargent Manufacturing (SAR) -351 EHT(D) Series.
- B. Electromagnetic Door Holders: Certified ANSI A156.15 electromagnetic door holder/releases with a minimum 20 to 40 pounds holding power and single coil construction able to accommodate.12VDC, 24VAC, 24VDC and 120VAC. Coils to be independently wound, employing an integral fuse and armatures to include a positive release button.
 - 1. Manufacturers:
 - a. LCN Door Closers (LCN) - SEM7800 Series.
 - b. Rixson (RIX) - 980/990 Series.
 - c. Sargent Manufacturing (SAR) - 1560 Series.

2.11 ARCHITECTURAL TRIM

- A. Door Protective Trim
 - 1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.
 - 2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1" LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.
 - 3. Where plates are applied to fire rated doors with the top of the plate more than 16" above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer's catalog and template book for specific requirements for size and applications.
 - 4. Protection Plates: ANSI/BHMA A156.6 certified protection plates (kick, armor, or mop), fabricated from the following:
 - a. Stainless Steel: 300 grade, 050-inch thick.
 - 5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.
 - 6. Manufacturers:

- a. Hiawatha, Inc. (HIA).
- b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (ROC).
- c. Trimco (TRI).

2.12 DOOR STOPS AND HOLDERS

- A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.
- B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.

1. Manufacturers:

- a. Hiawatha, Inc. (HIA).
 - b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (ROC).
 - c. Trimco (TRI).
- C. Overhead Door Stops and Holders: ANSI/BHMA A156.8, Grade 1 certified overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.

1. Manufacturers:

- a. Rixson Door Controls (RIX).
- b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (ROC).
- c. Sargent Manufacturing (SAR).

2.13 ARCHITECTURAL SEALS

- A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.
- B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.

February 27, 2026

1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.
- C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.
 1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NPFA 252, Standard Methods of Fire Tests of Door Assemblies.
- D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.
- E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
- F. Manufacturers:
 1. National Guard Products (NGP).
 2. Pemko Products; ASSA ABLOY Architectural Door Accessories (PEM).
 3. Reese Enterprises, Inc. (REE).

2.14 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.15 FINISHES

- A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly

February 27, 2026

construction, wall and floor construction, and other conditions affecting performance.

- B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.02 PREPARATION

- A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.
- B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.03 INSTALLATION

- A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
 - 1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
- B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
 - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
 - 2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
 - 3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
 - 4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.
- C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
- D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."
- E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.04 FIELD QUALITY CONTROL

- A. Field Inspection (Punch Report): Reference Division 01 Section "Closeout Procedures" for project punch and reporting requirements including compliance with approved submittals and verification door hardware is properly installed, operating and adjusted.

3.05 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.06 CLEANING AND PROTECTION

- A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.
- B. Clean adjacent surfaces soiled by door hardware installation.
- C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.07 DEMONSTRATION

- A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.08 DOOR HARDWARE SETS

- A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.
 - 1. Quantities listed are for each pair of doors, or for each single door.
 - 2. The supplier is responsible for handing and sizing all products.
 - 3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate selection for the material and application.
 - 4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified

February 27, 2026

hardware will work as required. Provide alternate solutions and proposals as needed.

S5102-SAMUEL MAHELONA MEMORIAL HOSPITAL

MANUFACTURER LIST

<u>CATEGORY</u>	<u>VENDOR NAME</u>	<u>MFG</u>
DOOR HARNESS (POE)	BY McKINNEY PRODUCTS COMPANY	MCK
FRAME HARNESS (POE)	BY McKINNEY PRODUCTS COMPANY	MCK
HINGE	BY McKINNEY PRODUCTS COMPANY	MCK
POE HINGE	BY McKINNEY PRODUCTS COMPANY	MCK
DOOR BOTTOM	BY PEMKO MANUFACTURING CO.	PEM
GASKETING	BY PEMKO MANUFACTURING CO.	PEM
OVERLAPPING ASTRAGAL	BY PEMKO MANUFACTURING CO.	PEM
SPLIT ASTRAGAL	BY PEMKO MANUFACTURING CO.	PEM
THRESHOLD	BY PEMKO MANUFACTURING CO.	PEM
AUTO FLUSH BOLT HM	BY ROCKWOOD MANUFACTURING CO.	ROC
COORDINATOR	BY ROCKWOOD MANUFACTURING CO.	ROC
DUST PROOF STRIKE	BY ROCKWOOD MANUFACTURING CO.	ROC
FLUSH BOLT	BY ROCKWOOD MANUFACTURING CO.	ROC
KICKPLATE	BY ROCKWOOD MANUFACTURING CO.	ROC
WALL OR FLOOR STOP	BY ROCKWOOD MANUFACTURING CO.	ROC
WALL STOP (CONVEX)	BY ROCKWOOD MANUFACTURING CO.	ROC
CLASSROOM LOCK	BY SARGENT MANUFACTURING COMPANY	SAR
DOOR CLOSER	BY SARGENT MANUFACTURING COMPANY	SAR
O.H. STOP	BY SARGENT MANUFACTURING COMPANY	SAR
OFFICE LOCK	BY SARGENT MANUFACTURING COMPANY	SAR
POE STORERM LOCK	BY SARGENT MANUFACTURING COMPANY	SAR
POE STORERM LOCK/DB	BY SARGENT MANUFACTURING COMPANY	SAR
PRIVACY SET	BY SARGENT MANUFACTURING COMPANY	SAR
STOREROOM LOCK	BY SARGENT MANUFACTURING COMPANY	SAR

HW GROUP - 001

ALL HARDWARE BY DOOR MANUFACTURER.

HW GROUP - 002

5.0 EA	HINGE	TA2314 4.5 X 4.5 US32D-NRP	MCK
1.0 EA	POE HINGE	POE-TA2314 4.5 X 4.5 US32D	MCK
1.0 SET	AUTO FLUSH BOLT HM	2842 626	ROC
1.0 EA	DUST PROOF STRIKE	570 626	ROC
1.0 EA	POE STORERM LOCK/DB	23-IN220 82276 BIKPS B LNL US26D WBS	SAR
		KEY TO EXISTING MASTER KEY SYSTEM.	
1.0 EA	COORDINATOR	1700 628	ROC
2.0 EA	DOOR CLOSER	351 CPS EN	SAR
1.0 EA	THRESHOLD	2746A (8/A-702)	PEM
1.0 EA	GASKETING	290AS JAMBS / 2891AS HEAD	PEM
2.0 EA	DOOR BOTTOM	345AV	PEM

HAWAII HEALTH SYSTEMS CORPORATION – KAUAI DIVISION
SMMH Emergency Department Renovation & Addition
Project No. 225057-01

Door Hardware
08710-17

February 27, 2026

1.0 EA	OVERLAPPING ASTRAGAL	357C		PEM
1.0 EA	DOOR HARNESS (POE)	POE-C_____	AS REQUIRED	MCK
1.0 EA	FRAME HARNESS (POE)	POE-C_____	AS REQUIRED	MCK

VERIFY ALL HARDWARE IS COMPATIBLE WITH
DOOR MANUFACTURER.

HW GROUP - 003

2.0 EA	HINGE	TA2314	4.5 X 4.5	US32D	MCK
1.0 EA	POE HINGE	POE-TA2314	4.5 X 4.5	US32D	MCK
1.0 EA	POE STORERM LOCK/DB	IN220 82276	BIKPS B LNL	US26D WBS	SAR
		KEY TO EXISTING MASTER KEY SYSTEM.			
1.0 EA	DOOR CLOSER	351	O	EN	SAR
1.0 EA	KICKPLATE	K1050	10" X 2"	LDW 630 B4E CSK	ROC
1.0 EA	WALL OR FLOOR STOP	406 630 / 441H	626	AS REQUIRED	ROC
1.0 EA	THRESHOLD	2746A	(8/A-702)		PEM
1.0 EA	GASKETING	290AS	JAMBS / 2891AS	HEAD	PEM
1.0 EA	DOOR BOTTOM	234AV			PEM
1.0 EA	DOOR HARNESS (POE)	POE-C_____	AS REQUIRED	MCK	
1.0 EA	FRAME HARNESS (POE)	POE-C_____	AS REQUIRED	MCK	

HW GROUP - 004

2.0 EA	HINGE	T4A3386	5 X 4.5	US32D	MCK
1.0 EA	POE HINGE	POE-T4A3386	5 X 4.5	US32D	MCK
1.0 EA	POE STORERM LOCK	IN220 82278	BIKPS B LNL	US26D WBS	SAR
		KEY TO EXISTING MASTER KEY SYSTEM.			
1.0 EA	DOOR CLOSER	1431	CPS	EN	SAR
1.0 EA	DOOR HARNESS (POE)	POE-C_____	AS REQUIRED	MCK	
1.0 EA	FRAME HARNESS (POE)	POE-C_____	AS REQUIRED	MCK	

HW GROUP - 005

3.0 EA	HINGE	TA2314	4.5 X 4.5	US26D	MCK
1.0 EA	CLASSROOM LOCK	8237	LNL	US26D WBS	SAR
		KEY TO EXISTING MASTER KEY SYSTEM.			
1.0 EA	DOOR CLOSER	1431	O	EN	SAR
1.0 EA	WALL STOP (CONVEX)	406 630			ROC

HW GROUP - 006

3.0 EA	HINGE	TA2314	4.5 X 4.5	US26D	MCK
1.0 EA	CLASSROOM LOCK	8237	LNL	US26D WBS	SAR
		KEY TO EXISTING MASTER KEY SYSTEM.			
1.0 EA	DOOR CLOSER	1431	O	EN	SAR
1.0 EA	KICKPLATE	K1050	10" X 2"	LDW 630 B4E CSK	ROC
1.0 EA	WALL OR FLOOR STOP	406 630 / 441H	626	AS REQUIRED	ROC
		SOLID THRESHOLD BY OTHER SECTION (WHERE DETAILED 4/A-702).			

HW GROUP - 007

February 27, 2026

3.0	EA	HINGE	TA2314	4.5 X 4.5	US26D	MCK
1.0	EA	OFFICE LOCK	8205	LNL	US26D WBS	SAR
			KEY TO EXISTING MASTER KEY SYSTEM.			
1.0	EA	DOOR CLOSER	1431	O	EN	SAR
1.0	EA	WALL STOP (CONVEX)	406	630		ROC

HW GROUP - 008

3.0	EA	HINGE	TA2314	4.5 X 4.5	US26D	MCK
1.0	EA	PRIVACY SET	LB-V21-8265	LNL	US26D WBS	SAR
1.0	EA	DOOR CLOSER	1431	P9	EN	SAR
1.0	EA	KICKPLATE	K1050	10" X 2"	LDW 630 B4E CSK	ROC
1.0	EA	WALL STOP (CONVEX)	406	630		ROC
			SOLID THRESHOLD BY OTHER SECTION (WHERE DETAILED 4/A-702).			

HW GROUP - 009

6.0	EA	HINGE	TA2314	4.5 X 4.5	US26D	MCK
1.0	EA	FLUSH BOLT	555	626	TOP ONLY	ROC
1.0	EA	DUST PROOF STRIKE	570	626		ROC
1.0	EA	STOREROOM LOCK	8204	LNL	US26D WBS	SAR
			KEY TO EXISTING MASTER KEY SYSTEM.			
2.0	EA	O.H. STOP	1546	S	US26D (18-1/2" - 25")	SAR
1.0	EA	THRESHOLD	2746A	(8/A-702)		PEM
2.0	EA	SPLIT ASTRAGAL	29310	CV		PEM

END OF SCHEDULE

END OF SECTION

SECTION 08800 - GLAZING

PART 1 - GENERAL

1.01 SUMMARY

- A. Work Includes: Provide all glass and glazing materials to complete all glazing work as shown and as specified herein.
- B. Related Work Described Elsewhere:
 - 1. Section 07910 – EXTERIOR WALL JOINT SEALANTS
 - 2. Section 08520 – GLAZED ALUMINUM SYSTEMS

1.02 QUALITY ASSURANCE

- A. Glass Standards: In addition to standards specified elsewhere, all glass, except as noted otherwise, shall comply with:
 - 1. ASTM C 1036, "Flat Glass".
 - 2. ASTM C 1048, "Heat Treated Flat Glass - Kind HS, Kind FT Coated and Uncoated".
 - 3. ASTM C 1172, "Standard Specification for Laminated Architectural Flat Glass".
 - 4. ASTM E 1886, Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.
 - 5. ASTM E 1996, Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.
 - 6. GANA's Glazing Manual.
 - 7. IGMA SIGMA TM-3000 Insulating Glass Units.
- B. Safety Glazing Standard: 16 CFR 1201 for heat treated and laminated glass and ANSI Z97.1 for wired glass when used for safety glazing, permanently marked with Safety Glazing Certification Council label. Comply with applicable code.
 - 1. Glazing lites more than 9 sq. ft. in exposed surface area of one side, provide glazing products that comply with Category II materials, for lites 9 sq. ft. or less in exposed surface area of one side, provide glazing products that comply with Category I or II materials, except for hazardous locations where Category II materials are required by 16 CFR 1201 and regulations of authorities having jurisdiction.
 - 2. Safety glazing is only required at the inboard lite of a full height vision glass (without intermediate horizontals or rails) except on the ground floor or other areas where there is a walking surface on both sides. Alternately, if an aluminum rail is used on the interior of the framing, neither lite need to be safety glazing.
- C. Limit glass deflection to 1/200 flexure limit of glass with full recovery of glazing materials.

February 27, 2026

- D. Sealants for glazing shall conform to AAMA 800, "Voluntary Specifications and Test Methods for Sealants" and AAMA 850, "Fenestration Sealant Guide Manual".
- E. Single source responsibility for glass: Provide materials produced by a single manufacturer or fabricator for each kind and condition of glass indicated and composed of primary glass obtained from a single source for each type and class required.

1.03 PERFORMANCE REQUIREMENTS

- A. Other Requirements: Coordinate and comply with applicable performance requirements included in specification Section 08110 STEEL DOORS AND FRAMES, Section 08210 WOOD DOORS, Section 08460 SLIDING AUTOMATIC ENTRANCE DOORS, Section 08520 GLAZED ALUMINUM SYSTEMS and ASTM E 2190.
- B. Glass Design: Glass and glazing capable of withstanding structural loads as specified in Contract Documents and applicable codes within limits and under conditions indicated, without material failure, or glass breakage of loss.
 - 1. Thickness Determination:
 - a. Design Quality Standard: ASTM E 1300.
 - b. Thickness: Those indicated are minimums and for detailing only, determine glass thicknesses based on project glazing analysis.
 - c. Probability of Breakage:
 - i. Vertical glazing or applications not more than 15 degrees off vertical: Not more than 8 per 1000 lites (Statistical Factor of 2.5), for 3 second load duration under conditions established by project glazing analysis.
 - d. Maximum Center Deflection: Flexure limit of glass on short side of lite or 1 in, whichever is less, supported on all 4 sides under conditions established by project glazing analysis, with full recovery of glazing materials.
 - 2. Human Impact Loads: Locations indicated glazed with safety glass as defined by authorities having jurisdiction.
 - 3. Glass Bite: Coordinated with glazing material and rabbet dimensions for glass bite and edge clearance required by glazing condition.
- C. Thermal and Optical Performance Properties: Glass with performance properties specified based on manufacturer's published test data, as determined according to following procedures:
 - 1. Monolithic Glass Lites: Properties based on units with lites 1/4-inch thick
 - 2. Sealed Insulating Glass Units: Properties based on units with lites 1/4-inch thick and a nominal 1/2-inch-wide air space
 - 3. Center-of-Glass Thermal Values: Based on LBL-44789 WINDOW 5.0 computer program for following methodologies:
 - a. U-Factors: NFRC 100 expressed as Btu/ sq. ft. x h x deg F
 - b. Solar Heat Gain Coefficient: NFRC 200.

- c. Solar Optical Properties: NFRC 300.
- D. Structural Glazing Sealant Limitations: Not more than 20 psi at design wind pressure, maximum building deflections, manufacturers written instructions, and following:
 - 1. Wind Pressure Force: Support in tension or shear, but not tension and shear simultaneously.
 - 2. Allowable Tension Stress or Shear Stress (but not combined tension and shear stress): Not more than 20 psi.
- E. Windborne-Debris-Impact Resistance Performance
 - 1. Performance shall be tested in accordance with ASTM E1886 and information in ASTM E1996.
 - a. Large-Missile Impact: For glass located within 30 feet of grade

1.04 SUBMITTALS

- A. Submit under the provisions of Section 01330 – SUBMITTAL PROCEDURES.
- B. Manufacturer's Data: Submit copies of manufacturer's product specifications, and instructions for handling, storing, installing, cleaning, and protecting each type of glass and glazing material. Provide data indicating structural and physical characteristics of each type of glass and glazing.
- C. Shop Drawings: Include following with glazed framing shop drawings required in Sections listed in 1.03A.
 - 1. Glass types, make-up, sizes, and thicknesses.
 - 2. Glazing materials manufacturers, products, types, and profiles.
 - 3. Glass bite, edge clearance, and depth of rabbet.
 - 4. Sealant thickness and profile.
- D. Samples: Submit 3 each 4 inches by 4-inch samples of each type and thickness of glass and glazing for acceptance prior to ordering.
- E. Installation Specifications: Submit manufacturer's and referenced glass and glazing manual, etc. for installation of field installed glazing.
- F. Delegated Engineering Calculations: Engineering calculations for portion of work designated as delegated engineering.
- G. Warranty: Copy of specified warranty.
- H. Glazing Certification: Certification of acceptance from primary glass manufacturer or fabricator for fabricated glass units certifying that glazing details, project conditions, installation procedures, and thicknesses and compositions of all glass, are suitable for the purpose intended and are in compliance with performance requirements and Contract Documents. Document to be signed by authorized representative.
- I. Product Testing Agency Qualifications: Accredited by NFRC CAP 1 Certification Agency Program.
- J. Product Test Reports: Reports based on evaluation of comprehensive tests performed by qualified testing agency for following:

February 27, 2026

1. Each primary glass type.
 2. Each fabricated glass unit.
 3. Glazing gaskets.
 4. Glazing sealants.
 5. Glazing accessories.
- K. Sealant Test Reports as specified in Section 07910 – EXTERIOR WALL JOINT SEALANTS, Section 07920 - SEALANTS.
- L. Maintenance Data: For inclusion maintenance manual required by appropriate Division 01 Section; include following:
1. Manufacturer's instructions for maintenance of installed work
 2. Methods and frequency recommended for maintaining optimum condition under anticipated use.
 3. Precautions against cleaning products and methods which may be detrimental to finishes and performance.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to the site in unopened containers, labeled plainly with manufacturers' names and brands. Store glass and setting materials in, safe, dry locations and do not unpack until needed for installation.
- B. Comply with manufacturer's instructions for shipping, handling, storing and protecting glass and glazing materials. Exercise exceptional care to prevent edge damage to glass.

1.06 LABELING

- A. Each piece of glass shall be of domestic manufacture and label, except as noted otherwise, showing the name of the manufacturer and the grade or quality thereof. The labels shall be intact before and after installations. When glass is not cut to size by the manufacturer, and is furnished unlabeled from local stock, the Contractor shall submit an affidavit stating the quality, thickness, type and manufacturer of the glass furnished.
- B. All safety glass shall bear a marking as specified in ANSI Z97.1 on each separate glass panel that shall remain visible after installation.

1.07 ENVIRONMENTAL REQUIREMENTS

- A. Provide ventilation to prevent condensation of moisture on glazing work during installation. Do not perform glazing work during damp or rainy weather.

1.08 WARRANTY

- A. Glass:
1. Fabricators Special Warranty: Furnish full replacement of work warranty, including products and installation of covering construction, for periods of time from date of substantial completion specified below due to defects,

February 27, 2026

faulty work and failures, signed by an authorized representative using manufacturer's standard form.

- a. Coated Glass Unit Products: 10 years.
- b. Laminated Glass Products: 5 years.
- c. Insulated Glass Unit Products: 10 years.

PART 2 - PRODUCTS

2.01 MANUFACTURER'S

- A. All glass products shall be of the quality as manufactured by PPG Industries, Inc., Pilkington LOF, ASG Industries, CE Glass Company, Globe Amerada Glass Co., Guardian Industries, Interpane Glass Co., Sierracin/Sylmar, Viracon, Inc., or approved equal.

2.02 LAMINATED GLASS UNITS

- A. Laminated Glass: ASTM C 1172, and complying with other specified requirements and with the following:
 1. Interlayer: Polymeric interlayer of thickness indicated with a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after laminating glass lites and installation.
- B. Laminating Process: Fabricate laminated glass to produce glass free of foreign substances and air or glass pockets.

2.03 SEALED INSULATING GLASS UNITS

- A. General: Preassembled units consisting of organically sealed panes of glass enclosing a hermetically sealed dehydrated air space.
 1. Comply with the following standards:
 - a. ASTM E 2190.
 - b. ASTM E 2188
 - c. IGMA TM-4000.
 - d. IGMA TR-1200.
 - e. IGMA TB-1400.
 2. For properties of individual glass panes making up units, refer to product requirements specified elsewhere in this section applicable to types, classes, kinds and conditions of glass products indicated.
 3. Unit composition and seals shall be designed to utilize load sharing between the two lites.
 4. Provide heat-treated panes of kind and at locations indicated or, if not indicated, provide heat-strengthened panes where recommended by manufacturer for application indicated and tempered where indicated or where safety glass is designated or required.

February 27, 2026

5. Performance characteristics designated for coated insulating glass are nominal values based on manufacturer's published test data for units with 1/4" thick panes of glass and 1/2-inch thick air space.
 6. U-values indicated are expressed in the number of Btu's per hour per sq. ft. per degree F difference.
- B. Insulating Glass Certification Program: Provide insulating glass units permanently marked either on spacers or at least one component pane of units with appropriate certification label of inspecting and testing organization indicated below:
1. Insulating Glass Certification Council (IGCC).
- C. Characteristics:
1. Thickness of Each Pane:
 - a. Exterior Lite: 1/4-inch monolithic glass
 - b. Interior Lite: 7/16-inch laminated glass
 2. Air Space Thickness: 3/8-inch.
 3. Sealing System: Dual seal. Hermetically sealed with polyisobutylene (primary) and silicone (secondary) at the perimeter of the units.
 4. Spacer System: Black anodized or painted aluminum spacer with three bent corners and one keyed-soldered corner or four bents corners. Only one seam is allowed in each spacer of each unit.
- D. Vacuum-Deposited Laminated/Insulating Glass Units (Storefront, Window and Doors): ASTM C 1376, Manufacturer's glass units with one pane of glass coated with a durable nitride or metallic oxide coating (Soft Coat Low-E), of color and on surface indicated, by manufacturer's standard deposition process, and complying with the following requirements:
1. Large Missile Impact Laminated/Insulated Glass Units: Consisting of one lite of fully tempered glass and two lites of heat strengthened float glass combined with a polymeric interlayer for an overall thickness of 1-1/16 – inch complying with the requirements of ASTM E 1886 and ASTM E 1996 for Large Missile Impact.
 - a. Exterior Pane: Float glass, Kind FT (Fully Tempered), Condition A, Type 1, Class 1 (Clear), Quality q3.
 - i. Low-E Coating: Vitro Solarban 70XL on the number two surface
 - ii. Thickness: 1/4-inch
 - b. Air Space: 3/8-inch.
 - c. Outer/Interior Lite: Float glass, Kind HS (Heat Strengthened), Condition A, Type 1, Class 1 (Clear), Quality q3, 3/16-inch thick.
 - d. Ionoplast Interlayer: Kuraray SentryGlas.
 - e. Thickness: 0.090-inch.
 - f. Color: Clear.
 - g. Inner/Interior Lite: Float glass, Kind HS (Heat Strengthened), Condition A Type 1, Class 1 (clear), Quality q3, 3/16-inch thick.

h. Performance Requirements:

- i. Visible Light Transmittance: 62 percent.
- ii. Summer Daytime U value: 0.31 Winter Nighttime U value: 0.31
- iii. Solar Heat Gain Coefficient: 0.28.

2.04 OTHER GLASS PRODUCTS

- A. Float Glass, Clear, Tempered, (Safety Glass): Kind FT (fully tempered), Condition A, Type 1, Class 1, Quality q3, 1/4-inch thick unless indicated or required otherwise.

2.05 GLASS QUALITY CONTROL

- A. Bow and warp. Glass manufacturer shall provide a QC program to detect and discard any lites which exceed the following tolerances:
1. Glass that has any deviation from flat (bow) of 0.15% of the shortest glass dimension.
 2. Where the heat-treating process results in essentially parallel ripples or waves, the deviation from flatness at any peak shall not exceed 0.0051-inch, and the difference between adjacent peaks shall not exceed 0.0031-inch.
 3. Where bow tolerance and wave tolerance differ, the stricter requirements shall govern.
 4. Direction of ripples shall be horizontal, consistent and in conformance with the architectural design.
- B. Edge quality. Glass manufacturer shall provide a QC program to detect and discard any lites which exceed the following tolerances:
1. Shark teeth shall not penetrate more than one-half of the glass thickness.
 2. Serration hackle may occur only within 6-inches of the corner.
 3. Flare shall not exceed 0.0394-inch as measured perpendicular to glass surface across the edge. Flare shall not occur at setting blocks.
 4. Bevel shall not exceed 0.0591-inch.
 5. Flake chips may occur only within 4-inch of corners; depth shall not exceed 0.0394-inch and length, or diameter shall not exceed 1/4-inch.

2.06 GLAZING MATERIALS

- A. General:
1. All gaskets and weatherstripping shall be EPDM, neoprene or dense extruded silicone in compliance with ASTM C509 with shop molded corners.
 2. Injection mold all corners of gaskets where compatible with installation procedures.
 3. All gaskets, weatherstripping and spacers shall have a continuous mechanical engagement to framing members and factory molded corners.
 4. All gasket corners shall be bed in an elastomeric sealant compatible with glazing gaskets.

February 27, 2026

5. When in direct contact with silicone sealants, all gaskets, spacers and setting blocks shall be heat cured silicone rubber-based material which is chemically compatible with the silicone sealant and with sufficient hardness for the specific purpose intended. Compatibility testing by the silicone sealant supplier/manufacturer shall be required.
6. As an alternate to extruded silicone gaskets for the gaskets used at structural silicone joints, Norton V2100 tape may be used as long as proper detailing is provided.
7. Interior and exterior gasket profiles shall be designed to produce a glass edge pressure of 12psf.
8. Refer to Section 07910 – EXTERIOR WALL JOINT SEALANTS for approved sealants and backer rods. Rod is not to be used in the glazing rabbet.
9. Cleaners, Primers and Sealers shall be type as recommended by manufacturers of sealant or gasket.
10. Where a wet seal is required, use a one-part non-acidic moisture-curing, neutral curing silicone sealant complying with F.S. TT-S-001543, Class A.

B. Glazing Tapes:

1. Shall be preformed macro-polyisobutylene with a continuous integral shim of a Shore "A" of 40 to 60.
2. Shall comply with AAMA 807.1.
3. Should compress to the shim without excessive force being required, as recommended by the glass manufacturer, to avoid pressure points or breakage.
4. Manufacturers:
 - a. Pecora Corporation: www.pecora.com.
 - b. Saint-Gobain Performance Plastics: www.plastics.saint-gobain.com.
 - c. Tremco, Inc.: www.tremcosealants.com

C. Gasket Glazing:

1. "Sponge" glazing gaskets shall be cellular neoprene or cellular EPDM complying with ASTM C509, Option 2. Sponge gaskets shall have a hardness of 40 ± 5 durometer Shore A and shall be compressed 20% to 35% in the final installed position.
2. "Wedge" glazing gasket shall be non-cellular neoprene, dense EPDM or dense extruded silicone complying with ASTM C864, Option 1. Wedge gaskets shall have a hardness of 75 ± 5 durometer Shore A for hollow profiles and 60 ± 5 for solid profiles.
3. Both gaskets shall be compatible for incidental point contact with structural or weatherseal silicones.

D. Setting Blocks:

1. Shall be neoprene or in the case of structural silicone glazing, use dense extruded silicone with a hardness of 85 ± 5 durometer Shore A, to comply with ASTM C864.
 - a. Setting blocks used for insulated glass units shall be silicone.

February 27, 2026

2. Shall have a minimum length of 4" and be located at quarter points, or as required by GANA and FGMA guidelines.
 3. Minimum width shall correspond to the glass thickness and retaining member but, in no case, shall be less than the glass thickness at point of contact.
 4. Shall be secured against migration.
 5. Shims used in conjunction with setting blocks must be of the same material, hardness, length and width as the setting blocks.
- E. Spacer Shims
1. Neoprene, EPDM, or Silicone, 60 to 70 Shore A durometer hardness, ASTM C 864 Option I. Minimum 3 inch (75 mm) long x one half the height of the glazing stop x thickness to suit application, self-adhesive on one face.
 - a. Shims used for insulated glass units shall be silicone
- F. Side Blocks
1. Locate side blocks where required within the upper half of each jamb for each light.
 2. Blocks shall be 65 ±5 durometer Shore A neoprene, EPDM or dense silicone, sized and profiled for intended use, to comply with ASTM C864.
 - a. Side Blocks used for insulated glass units shall be silicone
 3. Install block with 1/8" clearance between block and glass bearing surface.
 4. Block shall be sufficient length to prevent point loading on the glass.
 5. Locate side blocks where required within the upper half of each jamb for each light.
 6. Side blocks are not required where an individual glass light is continuously sealed with silicone at two or more edges, when the sealant is installed immediately following the setting of the glass.
- G. Spacer Tape: Preformed open cell, polyurethane; double sided adhesive; non-staining and non-migrating; compatible with silicone sealants, following physical properties:
1. Density: 31 lbs/cu ft according to ASTM D 1667
 2. Hardness: Shore A durometer of 35 according to ASTM D 2240.
 3. Tensile Strength: 180 psi according to ASTM D 412.
 4. Elongation: 125 percent according to ASTM D 412.
 5. Acceptable Manufacturers and Products:
 - a. Saint Gobain; (Norton) Thermalbond Spacer Tape, V2100 Series.
 - b. Tremco Commercial Sealants & Waterproofing; SGT-900 Series.
 - c. Pecora Corporation
- H. Back Bedding Silicone: Two-component, fast curing, silicone elastomeric adhesive, 100% silicone neutral cure sealant that rapidly builds adhesive and elastomeric strength for bedding and glazing of glass in accordance with ASTM C 1184.

February 27, 2026

1. Hardness: Shore A durometer of 28 according to ASTM D 2240.
2. Ultimate Tensile Strength: 230 psi according to ASTM D 412.
3. Ultimate Elongation: 280 percent according to ASTM D 412.
4. Movement Class: $\pm 50\%$ according to ASTM D 719.
5. Acceptable Manufacturers and Products:
 - a. Momentive; Rapid Strength RGS7700

2.07 FABRICATION

- A. Fabricate glass to sizes required to comply with wind loads for glazed openings indicated with edge clearances, bite and tolerances complying with recommendations of product manufacturer and referenced glazing standard as required to comply with system performance requirements.

PART 3 - EXECUTION

3.01 GENERAL

- A. Perform all glazing in strict accordance with applicable provisions of the "Glazing Manual" and "Sealant Manual" published by the Flat Glass Marketing Association, Topeka, Kansas.
- B. Verify that openings for glazing are correctly sized, within tolerance, and glazing channels or recesses are clean, free of obstructions, and ready to receive glazing.

3.02 INSTALLATION

- A. Glass shall be set true and tight by skilled glaziers. Glazing compound shall be neatly and cleanly run with corners carefully made, using putty knife for all work. Glazing stops shall be carefully handled and accurately secured in place.
- B. Install setting blocks of proper size in sill rabbet, located one quarter of glass width from each corner, but with edge nearest corner not closer than 6-inches from corner, unless otherwise required. Set blocks in thin course of sealant which is acceptable for heel bead use.
- C. Provide spacers inside and out, of correct size and spacing to preserve required face clearances, for glass sizes larger than 50 united inches (length plus height), except where gaskets or glazing tapes with continuous spacer rods are used for glazing. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width, except with sealant tape use thickness slightly less than final compressed thickness of tape.
- D. Provide edge blocking to comply with requirements of referenced glazing standard, except where otherwise required by glass unit manufacturer.
- E. Set units of glass in each series with uniformity of draw, bow and similar characteristics.
- F. Provide compressible filler rods or equivalent back-up material, as recommended by sealant and glass manufacturers, to prevent sealant from extruding into glass

channel weep systems and from adhering to joints back surface as well as to control depth of sealant for optimum performance, unless otherwise indicated.

- G. Force sealants into glazing channels to eliminate voids and to ensure complete “wetting” or bond of sealant to glass and channel surfaces.
- H. Tool exposed surfaces of sealants to provide a substantial “wash” away from glass. Install pressurized tapes and gaskets to protrude slightly out of channel, so as to eliminate dirt and moisture pockets.
- I. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage to ensure that gasket will not “walk” out when installation is subjected to movement.
- J. Miter cut wedge-shaped gaskets at corners and install gaskets in manner recommended by gasket manufacture to prevent pull away at corners; seal corner joints and butt joints with sealant recommended by gasket manufacturer.
- K. Glass where secured by glazing stops, shall unless shown on drawings or specified herein, be set in full bed of glazing compound. Then force glazing stop into glazing compound on both sides and strikeoff flush.
- L. Glass where required or recommended by glass frame manufacturer shall be set in extruded vinyl or neoprene glazing strips provided by others and shall be installed in strict accordance with manufacturer’s instructions.
- M. Sheet glass shall be cut and set with the visible lines or waves horizontal.

3.03 INSTALLING GLASS WITH STRUCTURAL SEALANT

- A. Comply with Section 07910 - EXTERIOR WALL JOINT SEALANTS
- B. Sealant Edges: Before applying structural sealant, mask joint edges to ensure neat sealant lines; remove immediately after joint is tooled.
- C. Priming Substrates: If recommended by structural sealant manufacturer, apply primer to substrates to be sealed.
- D. Spacer Tape:
 - 1. Install continuously in smooth straight lines, between glass lites and glazing stops to maintain glass face clearances and to prevent structural sealant from extruding into glass channel and blocking weep systems until sealant cures.
 - 2. Secure in place and in position to control depth of installed sealant relative to edge clearance for optimum structural sealant performance
- E. Foam Backer Rods:
 - 1. Install without gaps, twisting, stretching, or puncturing backing material.
 - 2. Use gage to ensure uniform depth to achieve correct profile, coverage, and performance.
- F. Bond-Breaker Tape: Install on backside of joint where backing is not feasible.
- G. Structural Sealant Glazing: Follow silicone structural glazing manufacturer’s installation instructions.
 - 1. Place glass to be glazed in position taken care not to contaminate the cleaned surfaces. Set backers or spacers in the appropriate position to allow

for the required contact area or structural bite of the structural sealant glazing.

2. Complete horizontal joints prior to vertical joints lapping vertical over horizontal sealant.
3. Apply sealant into the structural glazed joint cavity completely fill it with sealant. Avoid air entrapment by pushing the head of the sealant into the joint in a continuous manner.
4. Tool sealant joint with tooling spatula or other approved device pushing sealant in to the joint to ensure the sealant wets out the joint surfaces and has adequate contact with the surfaces being sealed. Tooling should be done within ten minutes of sealant application.
5. If joints are masked off, the tape must be removed before the sealant begins to cure. Clean up any excess sealant with clean solvent soaked cloth before it cures.
6. Temporary support glass while structural sealant cures. Supports shall remain in place until sealant has developed its full adhesion and strength.
7. Inspect structural glazed joints to determine the joints have been filled and tooled properly. Periodically inspect the joints during the curing time to ensure joint are curing properly.

3.04 PROTECTION AND REPLACEMENT

All glass shall be immediately protected against damage. Glazed openings shall be identified with suitable warning tapes, cloth or paper flags, or other acceptable method that will not damage glazing or surrounding materials. At completion of work, all imperfect glass which cannot be properly cleaned shall be replaced in kind. All broken, chipped, abraded, cracked or otherwise damaged glass must be replaced subject to the acceptance of the Architect.

3.05 CLEANING AND WASHING

At the completion of construction, clean and wash glass provided, removing all labels, dirt, putty stains, paint, etc., and leave the glass perfectly cleaned and polished.

END OF SECTION

SECTION 08830 - MIRRORS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes the following types of silvered flat glass mirrors:
 - 1. Film-backed glass mirrors qualifying as safety glazing.
- B. Related Work Described Elsewhere:
 - 1. Section 06200 – FINISH CARPENTRY for wood frames
 - 2. Section 08800 - GLAZING

1.02 SUBMITTALS

- A. Product Data: For each type of product indicated.
 - 1. Mirrors. Include description of materials and process used to produce each type of silvered flat glass mirror specified that indicates sources of glass, glass coating components, edge sealer, and quality-control provisions.
- B. Shop Drawings: Include mirror elevations, edge details, mirror hardware, and attachments to other work.
- C. Samples: For each type of the following products:
 - 1. Mirrors: 12 inches square, including edge treatment on two adjoining edges.
 - 2. Mirror Clips: Full size.
- D. Qualification Data: For qualified Installer.
- E. Product Certificates: For each type of mirror and mirror mastic, from manufacturer.
- F. Preconstruction Test Reports: From mirror manufacturer indicating that mirror mastic was tested for compatibility and adhesion with mirror backing paint and substrates on which mirrors are installed.
- G. Maintenance Data: For mirrors to include in maintenance manuals.
- H. Warranty: Sample of special warranty.

1.03 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.
- B. Source Limitations for Mirrors: Obtain mirrors from single source from single manufacturer.
- C. Source Limitations for Mirror Accessories: Obtain mirror glazing accessories from single source.
- D. Glazing Publications: Comply with the following published recommendations:

February 27, 2026

1. GANA's "Glazing Manual" unless more stringent requirements are indicated. Refer to this publication for definitions of glass and glazing terms not otherwise defined in this Section or in referenced standards.
 2. GANA Mirror Division's "Mirrors, Handle with Extreme Care: Tips for the Professional on the Care and Handling of Mirrors."
- E. Safety Glazing Products: For film-backed mirrors, provide products complying with testing requirements in 16 CFR 1201 for Category II materials.
- F. Preconstruction Mirror Mastic Compatibility Test: Submit mirror mastic products to mirror manufacturer for testing to determine compatibility of mastic with mirror backing paint and substrates on which mirrors are installed.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Protect mirrors according to mirror manufacturer's written instructions and as needed to prevent damage to mirrors from moisture, condensation, temperature changes, direct exposure to sun, or other causes.
- B. Comply with mirror manufacturer's written instructions for shipping, storing, and handling mirrors as needed to prevent deterioration of silvering, damage to edges, and abrasion of glass surfaces and applied coatings. Store indoors.

1.05 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install mirrors until ambient temperature and humidity conditions are maintained at levels indicated for final occupancy.

1.06 COORDINATION

- A. Coordinate size of mirror and locations of mirror clips with the wood moulding fabrication specified in Section 06200 – FINISH CARPENTRY to ensure proper fit.

1.07 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which mirror manufacturer agrees to replace mirrors that deteriorate within specified warranty period. Deterioration of mirrors is defined as defects developed from normal use that are not attributed to mirror breakage or to maintaining and cleaning mirrors contrary to manufacturer's written instructions. Defects include discoloration, black spots, and clouding of the silver film.

1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 FLAT GLASS MIRRORS

- A. Glass Mirrors, General: ASTM C 1503.
- B. Clear Glass: Mirror Select Quality. One surface of the glass shall have silver coating and copper-free protective film backing. Two coats of mirror backing paint shall be applied over the backing and edges of the mirror.

February 27, 2026

1. Nominal Thickness: 1/4-inch.
2. Size: As indicated on the Drawings

2.02 MISCELLANEOUS MATERIALS

- A. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- B. Edge Sealer: Coating compatible with glass coating and approved by mirror manufacturer for use in protecting against silver deterioration at mirrored glass edges.
- C. Mirror Mastic: An adhesive setting compound, asbestos-free, produced specifically for setting mirrors and certified by both mirror manufacturer and mastic manufacturer as compatible with glass coating and substrates on which mirrors will be installed.
- D. Film Backing for Safety Mirrors: Film backing and pressure-sensitive adhesive; both compatible with mirror backing paint as certified by mirror manufacturer.

2.03 MIRROR HARDWARE

- A. Mirror Top Clips: C.R. Laurence two-piece anochrome mirror clips Model No. KV278.
- B. Fasteners: Fabricated of same basic metal and alloy as fastened metal and matching it in finished color and texture where fasteners are exposed.
- C. Anchors and Inserts: Provide devices as required for mirror hardware installation. Provide toothed or lead-shield expansion-bolt devices for drilled-in-place anchors. Provide galvanized anchors and inserts for applications on inside face of exterior walls and where indicated.

2.04 FABRICATION

- A. Mirror Sizes: To suit Project conditions cut mirrors to final sizes and shapes.
- B. Cutouts: Fabricate cutouts for notches and holes in mirrors without marring visible surfaces. Locate and size cutouts so they fit closely around penetrations in mirrors.
- C. Mirror Edge Treatment:
 1. Flat polished
 2. Seal edges of mirrors with edge sealer after edge treatment to prevent chemical or atmospheric penetration of glass coating.
 3. Require mirror manufacturer to perform edge treatment and sealing in factory immediately after cutting to final sizes.
- D. Film-Backed Safety Mirrors: Apply film backing with adhesive coating over mirror backing paint as recommended in writing by film-backing manufacturer to produce a surface free of bubbles, blisters, and other imperfections.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates, over which mirrors are to be mounted, with Installer present, for compliance with installation tolerances, substrate preparation, and other conditions affecting performance of the Work.
- B. Verify compatibility with and suitability of substrates, including compatibility of mirror mastic with existing finishes or primers.
- C. Proceed with installation only after unsatisfactory conditions have been corrected and surfaces are dry.

3.02 PREPARATION

- A. Comply with mastic manufacturer's written installation instructions for preparation of substrates, including coating substrates with mastic manufacturer's special bond coating where applicable.

3.03 INSTALLATION

- A. General: Install mirrors to comply with mirror manufacturer's written instructions and with referenced GANA publications. Mount mirrors accurately in place in a manner that avoids distorting reflected images.
- B. Provide a minimum air space of 1/8 inch between back of mirrors and mounting surface for air circulation between back of mirrors and face of mounting surface.
- C. Mastic Mounted Mirrors: Install mirrors with mastic and mirror hardware. Attach mirror hardware securely to mounting surfaces with mechanical fasteners installed with anchors or inserts as applicable. Install fasteners so heads do not impose point loads on backs of mirrors.
 - 1. Mirror Clips: Place a felt or plastic pad between mirror and each clip to prevent spalling of mirror edges. Locate clips where indicated.
 - 2. Install mastic as follows:
 - a. Apply barrier coat to mirror backing where approved in writing by manufacturers of mirrors and backing material.
 - b. Apply mastic to comply with mastic manufacturer's written instructions for coverage and to allow air circulation between back of mirrors and face of mounting surface.
 - c. After mastic is applied, align mirrors and press into place while maintaining a minimum air space of 1/8-inch between back of mirrors and mounting surface.

3.04 CLEANING AND PROTECTION

- A. Protect mirrors from breakage and contaminating substances resulting from construction operations.
- B. Do not permit edges of mirrors to be exposed to standing water.
- C. Maintain environmental conditions that will prevent mirrors from being exposed to moisture from condensation or other sources for continuous periods of time.

February 27, 2026

- D. Wash exposed surface of mirrors not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash mirrors as recommended in writing by mirror manufacturer.

END OF SECTION

SECTION 09250 - GYPSUM BOARD ASSEMBLIES

PART 1 - GENERAL

1.01 SUMMARY

- A. Work Includes: Gypsum board work including, but not limited to, the following:
 - 1. Gypsum board.
 - 2. Non-load bearing metal stud framing for gypsum board.
 - 3. Metal ceiling suspension system.
- B. Related Work Described Elsewhere:
 - 1. Wood blocking for interior work is provided under Section 06100 – ROUGH CARPENTRY
 - 2. Acoustical insulation is provided under Section 07210 - BUILDING INSULATION.

1.02 QUALITY ASSURANCE

- A. Fire Resistive Design: The construction shall comply with the applicable provisions of 2018 IBC, including all local amendments thereto and shall have been tested according to ASTM E 119 by an independent testing and inspecting agency acceptable to the authorities having jurisdiction. Installation and materials shall be in strict accordance with the above-mentioned code.
 - 1. The Fire-Resistant Design shall be as indicated from UL's "Fire Resistance Directory", FM's "Approval Guide, Building Products", GA-600 "Fire Resistance Design Manual", or as listed otherwise.
- B. Industry Standard: Comply with applicable requirements of GA 216 "Application and Finishing of Gypsum Board" and GA 214, "Recommended Specification: Levels of Gypsum Board Finish" by the Gypsum Association, except where more detailed or more stringent requirements are indicated including the recommendations of the manufacturer.
- C. Transverse Loading: The non-load bearing metal framing shall be capable of carrying a transverse load of 5 psf without exceeding the allowable stress or a deflection of L/240. Increase stud gauge, decrease stud spacing, or provide hidden from view lateral bracing to comply with these requirements at no additional cost to the Owner.
- D. STC-Rated Assemblies: For STC rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.
- E. Gypsum Board Terminology: Refer to ASTM C 11, "Terminology Relating to Gypsum and Related Building Materials and Systems", for definition of terms for gypsum board assemblies not defined in this Section or in referenced standards.

1.03 SUBMITTALS

- A. Submit under the provisions of Section 01330 - SUBMITTAL PROCEDURES.
- B. Manufacturer's Data: Material description and manufacturer's recommended installation procedures for each material.
- C. Submit shop drawings indicating fabrications and location of control and expansion joints including plans, elevations, sections, details, and attachment to adjoining work. Submit setting drawings for backing plates and anchors.

1.04 PRODUCT HANDLING

- A. Deliver gypsum wallboard materials in sealed containers and bundles, fully identified with manufacturer's name, brand, type and grade; store in a dry well-ventilated space, protected from the weather, under cover and off the ground. Stack gypsum panels flat to prevent sagging. Joint materials shall be stored in accordance with manufacturer's printed instructions. Damaged or deteriorated materials shall be removed from jobsite.
- B. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. General: Provide panels in maximum lengths and widths available that will minimize joints and correspond with the applicable support system.
- B. Gypsum Wallboard: ASTM C 1396 "Gypsum Wallboard", 5/8 inch unless specifically noted as 1/2-inch thick, tapered edge type, 48 inches wide, Type "R" regular for all non-rated walls and Type "X" (Special Fire Retardant) for fire rated partitions and elsewhere as indicated.
- C. Water Resistant Board: ASTM C 1396, Type "WR" water-resistant backing board, 5/8-inch thick unless indicated otherwise, with tapered edges, 48 inches wide, unless indicated otherwise (for walls only). Provide Type "WR-X" (Special Fire Retardant) for fire rated partitions.
- D. Tile Backer Board: ASTM C 1178 "Glass Mat Faced Water-Resistant, Gypsum Backing Board", glass mat reinforced gypsum backer board, nominal 5/8-inch-thick, for hard tile backing, equal to Dens-Shield Tile Backer by Georgia Pacific. Provide tape and joint compound materials as recommended by manufacturer.
- E. Wallboard Fasteners: ASTM C 1002 "Steel Drill Screws for the Application of Gypsum or Metal Plaster Bases", standard bugle head self-drilling, self-tapping corrosive-resistant drywall screws, Screws used in fire-resistive rated construction shall be of type approved for use by governing building code.
- F. Joint Treatment Materials: ASTM C 475 "Joint Compound and Joint Tape for Finishing Gypsum Board", materials for treating joints and fastener heads shall be as manufactured or recommended by the Manufacturer of the wallboard used. Provide "setting" type joint compound that is unaffected by humidity for water resistant board.

1. Tile Backer Board Joint Treatment:
 - a. Joint Compound: Same material specified in Section 09310 – CERAMIC TILE used to thinset tile to the backer board or type recommended by manufacturer for the application indicated.
 - b. Sealant: (JS-XX) One-part mildew-resistant silicone, sealant conforming to ASTM C 920 as specified in Section 07920 – SEALANTS.
- G. Non-Load Bearing Studs: Comply with ASTM C 754 for conditions indicated. ASTM C 645 “Non-Load (Axial) Bearing Studs, Runners (Track), and Rigid Furring Channels for Screw Application of Gypsum Board”, studs shall be 1-5/8, 2-1/2, 3-5/8, and 6 inches unless indicated otherwise on the drawings. Studs shall be rolled formed channel of 25, 20 and 16-gauge galvanized steel, ASTM A 653 “Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process”, G60 coating. Provide holes and notches for conduit or electrical wiring. Typical stud gauge shall be 25 gauge unless noted otherwise in the Drawings or this section. Provide minimum 20-gauge at ceramic and stone tile partitions.
 1. Provide the appropriate gauge studs and stud spacing for the specified Transverse Loading of this Project based on the ASTM C 754, Maximum Stud Height Tables.
- H. Tracks: Metal floor and ceiling tracks shall be rolled formed channel of gauge electro-zinc plated steel of same gauge as stud with width dimensions suitable to corresponding stud sizes indicated on the drawings.
- I. Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; same gauge as stud and in width to accommodate depth of studs. The U-shape track is 2-1/2-inches deep and has 1-1/2-inches vertical slots spaced 1” along both legs and is fabricated from hot-dipped galvanized steel complying with ASTM A653.
- J. Track Fasteners: Power-driven fasteners of size and material required to withstand loading conditions imposed on partition or shaft wall assemblies without exceeding allowable design stress of track, fasteners, or structural substrates in which anchors are embedded.
 1. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 10 times design load, as determined by testing according to ASTM E 1190 conducted by a qualified testing agency.
 - a. Products: Subject to compliance with the requirements, provide power actuated fasteners with top hat or washer to for larger bearing surface against track and increased resistance to pullover as manufactured by one of the following:
 - 1) ITW Ramset
 - 2) Hilti
 - 3) Powers
 - 4) or Approved Equal

- K. Furring Channels: ASTM C 645, hat-shaped, 7/8-inch-deep, hot-dipped galvanized, 25 gauge.
- L. Wire for Ties: ASTM A 641/A 641 M "Zinc-Coated (Galvanized) Carbon Steel Wire", Class 1 zinc coating, soft temper, 8 gauge for hangers supporting up to 12.5 square feet and 6 gauge where supporting up to 16 square feet and 18 gauge for ties.
- M. Carrying Channels: Cold-rolled, commercial-steel sheet with a base-metal thickness of 0.053-inch, depth of 1-1/2-inch and minimum 1/2-inch-wide flanges.
- N. Wallboard Accessories: ASTM C 1047 "Accessories for Gypsum Wallboard and Gypsum Veneer Base", Vinyl Corp., Plastic Components Inc., Vinyl Tech or approved equal.
 - 1. Standard Corner Bead: Vinyl Corp. Corner Bead CB 125 at all outside corners of wall, ceiling, and soffit as indicated.
 - 2. Casing Trim: Vinyl Corp. "L" Bead SB 58, "J" Bead MJB5B, or approved equal as indicated.
 - 3. Control Joint: Vinyl Corp. CJV 16 or approved equal.
 - 4. Other Accessories: As indicated or necessary for complete installation.
 - 5. All accessories shall be vinyl, PVC, or approved equal.
- O. Ceiling Support Materials and Systems:
 - 1. General: Size ceiling support components to comply with ASTM C 754 "Installation of Steel Framing Members to Receive Screw-Attached Gypsum" unless indicated otherwise.
 - 2. Direct Suspension Systems: Manufacturer's standard zinc-coated or painted steel system of furring runners, furring tees, and accessories designed for concealed support of gypsum drywall ceilings; of proper type for use intended. System Manufacturer: Equal to one of the following:
 - a. Armstrong World Industries, Inc.
 - b. Chicago Metallic Corp.
 - c. USG Interiors, Inc.
 - 3. Wire for Hangers and Ties: ASTM A 641/A 641 M "Zinc-Coated (Galvanized) Carbon Steel Wire", Class 1 zinc coating, soft temper, 8-gauge for hangers supporting up to 12.5 square feet and 6 gauge where supporting up to 16 square feet and 18 gauge for ties.
- P. Laminating Adhesive: Special adhesive or joint compound specifically recommended for laminating gypsum boards.
- Q. Backing Plates: 22-gauge galvanized steel sheet for blocking and bracing in length and width required.

PART 3 - EXECUTION

3.01 EXAMINATION

Examine substrates to which drywall construction attaches or abuts, including preset hollow metal frames, structural framing, and other construction with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of drywall construction. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. General: Comply with ASTM C 840 "Application and Finishing of Gypsum Board", Gypsum Association GA 216 and ASTM C 754 as applicable to the type of substrate and drywall support system indicated.

B. Tolerances:

1. Maximum variation of finish surface from true flatness shall be 1/8-inch in 10-feet in any direction unless specified otherwise.
2. Maximum variation of plumbness of wall shall be 1/8 inch in 10 feet of height.
3. Maximum variation from true position shall be 1/8 inch.

C. Ceiling Support Suspension Systems:

1. Secure hangers to structural support by connecting directly to structure where possible, otherwise connect to inserts, clips or other anchorage devices or fasteners as indicated. Ensure that structural anchorage provisions have been installed to receive ceiling anchors in a manner that will develop their full strength and at spacing required to support ceiling.
2. Coordinate installation of ceiling suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive ceiling hangers at spacing required to support ceilings and that hangers will develop their full strength.
3. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or ceiling suspension system. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, counter-splaying, or other equally effective means.
4. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with the location of hangers required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.
5. Secure hangers to structure, including intermediate framing members, by attaching to inserts, eye-screws, or other devices and fasteners that are

secure and appropriate for structure and hanger, and in a manner that will not cause hangers to deteriorate or otherwise fail.

6. Secure wire hangers by looping and wire-tying, either directly to structures or to inserts, eye-screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause them to deteriorate or otherwise fail.
7. Sway brace ceiling to conform to the applicable seismic zone and uplift, applicable requirements of ASTM E 580, "Application of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Requiring Seismic Restraint", and the manufacturer's recommendations.
8. Space main runners 4 feet on center and space hangers 4 feet on center along runners, except as otherwise shown.
9. Level main runners to a tolerance of 1/8 inch in 12 feet, measured both lengthwise on each runner and transversely between parallel runners.
10. Wire-tie or clip furring members to main runners and to other structural supports as indicated or as recommended by the manufacturer.
11. Direct-hung Metal Support System: Attach perimeter wall track or angle wherever support system meets vertical surfaces. Mechanically join support members to each other and butt-cut to fit into wall track.
12. Space furring member 16 inches on center, except as otherwise indicated.
13. Install auxiliary framing at termination of drywall work, and at openings for light fixtures and similar work, as required for support of both the drywall construction and other work indicated for support thereon.
14. Do not connect or suspend steel framing from ducts, pipes, or conduit.
15. Keep hangers and braces 2 inches clear of ducts, pipes, and conduits.

D. Non-Load Bearing Metal Wall Framing:

1. Install supplementary framing, blocking, and bracing to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, and similar work which cannot be adequately supported on gypsum board alone to comply with details indicated and with recommendations of gypsum board manufacturer, or if none are available, with "Gypsum Construction Handbook" published by United States Gypsum Co.
2. Isolate stud system from transfer of structural loading to system, both horizontally and vertically. Provide slip or cushioned type joints to attain lateral support and avoid axial loading.
3. Install runner tracks at floors, ceilings, and structural walls and columns where gypsum drywall stud system abuts other work, except as otherwise indicated.
4. Space studs and furring 16 inches on center, except as otherwise indicated.
5. Install steel studs so flanges point in the same direction and leading edge or end of each panel can be attached to open (unsupported) edges of stud flanges first.

6. Install 20-gauge studs spaced at 16-inches on center in walls scheduled to receive ceramic or stone tile and in walls that support wall cabinets and shelving.
7. Install 16-gauge studs spaced at 16-inches on center in walls where wall-mounted items are to be installed.
8. Frame door openings with vertical studs securely attached by screws at each jamb either directly to frames or to jamb anchor clips on door frame in accordance with door manufacturer's recommendations; install runner track sections (for jack studs) at head and secure to jamb studs. Provide runner tracks of same gauge as jamb studs. Space jack studs same as partition studs.
9. Install 20-gauge studs at each jamb for all doors 2'-8" wide to 4 feet wide weighing not more than 200 pounds; and for all doors less than 2'-8" wide weighing more than 100 pounds but not more than 200 pounds.
10. Install double 20-gauge studs for single doors up to 4 feet wide, weighing more than 200 pounds but not more than 300 pounds; screw attach web of back-to-back studs direct to jamb anchor clips nested between flange of stud.
11. Frame openings other than door openings in same manner as required for door openings; and install framing below sills of openings to match framing required above door heads.
12. Install each steel framing and furring member so that fastening surface does not vary more than 1/8-inch from plane of faces of adjacent framing.

E. Gypsum Wallboard, General:

1. Locate exposed end-butt joints as far from center of walls and ceilings as possible.
2. Install exposed gypsum board with face side out. Do not install imperfect, damaged, or damp boards. Butt boards together for a light contact at edges and ends with not more than 1/16-inch open space between boards. Do not force into place.
3. Locate either edge or end joints over supports, except in horizontal applications or where intermediate supports or gypsum board back-blocking is provided behind end joints. Position boards so that both tapered edge joints abut, and mill-cut or field-cut end joints abut. Do not place tapered edges against cut edges or ends. Stagger vertical joints over different studs on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
4. Attach gypsum board to framing and blocking as required for additional support at openings and cutouts.
5. Cover both faces of stud partition framing with gypsum board in concealed spaces (above ceilings, etc.), except in chase walls which are properly braced internally. Where concealed application is required for sound, fire, air or smoke ratings, coverage may be accomplished with scraps of not less than 8 square foot area and may be limited to not less than 75 percent of full coverage.

6. Isolate perimeter of non-load-bearing drywall partitions at structural abutments. Provide 1/4 inch to 3/8-inch space and trim edge with J-type semi-finishing edge trim. Seal joints with acoustical sealant. Do not fasten drywall directly to stud system runner tracks.
7. Space fasteners in gypsum boards in accordance with referenced standards and manufacturer's recommendations, except as otherwise indicated.
8. Install insulation at framing as indicated. Size insulation to width of members spacing. Press friction fit insulation between members as recommended by the insulation manufacturer. Insulation is provided under Section 07210 - BUILDING INSULATION.
9. Tile Backer Unit: Install tile backer units in accordance with manufacturer's instructions and TCNA methods specified in Section 09310 – CERAMIC TILE.
10. For ceilings over showers and shower areas provide tile backer units and finish to a Level 5 finish and make ready to receive scheduled paint finish.

F. Methods of Gypsum Wallboard Application:

1. On ceilings, apply gypsum board prior to wall/partition board application, to greatest extent possible and at right angle to framing, unless otherwise indicated.
2. Install ceiling board panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in the central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
3. Single-Layer Application:
 - a. On partitions/walls higher than 8'-1", apply gypsum board vertically (parallel), unless otherwise indicated, and provide sheet lengths which will minimize end joints.
 - b. On partitions/walls 8'-1" or less in height apply gypsum board horizontally (perpendicular); use maximum length sheets possible to minimize end joints.
4. Single-Layer Fastening Method: Apply gypsum boards to supports by fastening with screws, spaced not to exceed 16-inch centers for walls and 12-inch centers for ceilings.
5. Gypsum wallboard construction for fire rated and acoustical rated assemblies shall be in accordance with the design number indicated or if not indicated in accordance with 2018 IBC.
6. Multi-Layer Application on Partitions/Walls: Apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.

G. Installation of Trim Accessories:

1. General: Where feasible, use the same fasteners to anchor trim accessory flanges as required to fasten gypsum board to the supports. Otherwise, attach trim in accordance with manufacturer's instructions and recommendations.
 2. Install corner beads at external corners.
 3. Install edge trim whenever edge of gypsum board would otherwise be exposed or semi-exposed. Provide type with face flange to receive joint compound except where semi-finishing type is indicated. Install L-type trim where work is tightly abutted to other work and install special kerf-type where other work is kerfed to receive long leg of L-type trim. Install U-type trim where edge is exposed, revealed, gasketed, or sealant-filled (including expansion joints).
 4. Install J or LC-type semi-finishing trim where indicated.
 5. Install control joints where indicated or necessary in large ceiling and wall expanses. Use door header to ceiling or floor to ceiling in long partitions and wall furring runs and from wall to wall in large ceiling areas. Where joint will be conspicuous, obtain approval prior to installation.
- H. Acoustical Rated Assemblies: Seal construction at perimeters, behind control and expansion joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM E 497, "Installing Sound-Isolating Gypsum Board Partitions", ASTM C 919, "Use of Sealants in Acoustical Applications", and manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through gypsum board assemblies, including sealing partitions above acoustical ceilings.

3.03 DRYWALL FINISHING

- A. General: Apply treatment at gypsum board joints (both directions), flanges of trim accessories, penetrations, fasteners heads, surface defects and elsewhere in accordance with ASTM C 840 and Gypsum Association GA 216 and GA 214 as required to prepare work for decoration. Prefill open joints, rounded or beveled edges, and damaged surfaces using type of compound recommended by manufacturer.
1. Apply joint tape at joints between gypsum boards, except where a trim accessory is indicated that does not require tape.
 2. Apply joint compound in 3 coats (not including prefill of openings in base), and sand between last 2 coats and after last coat. Fastener heads, dents, gouges, and cut-outs shall be filled with joint compound and sanded.
 3. Accessories at exposed joints, edges, corners, openings, and similar locations shall be taped, floated with joint compound, and sanded to produce surfaces ready for gypsum board finishes.
 4. Treatment for water-resistant gypsum wallboard shall be as recommended by the gypsum wallboard manufacturer.
- B. Finish interior gypsum wallboard by applying the following levels of gypsum board finish in accordance with GA-214.

1. Level 1: For ceiling plenum areas and other concealed areas.
 2. Level 2: Where wall panels form substrates for tile. For tile backer board finish in accordance with backer board manufacturer and TCNA methods specified in Section 09310 – CERAMIC TILE.
 3. Level 4: For ceiling surfaces to receive flat paint and wall surfaces to receive an eggshell finish and wall surfaces to receive all grades of wall covering.
 4. Level 5: For wall and ceiling surfaces in critical lighting area as defined by GA-214 as well as gypsum wallboard surfaces scheduled to receive semi-gloss paint.
 5. Where Level 5 gypsum board finish is indicated, embed tape in joint compound and apply first, fill (second), and finish (third) coats of joint compound over joints, angles, fastener heads, and accessories; and apply a thin, uniform skim coat of joint compound over entire surface. For skim coat, use joint compound specified for third coat, or a product specially formulated for this purpose and acceptable to gypsum board manufacturer. Touch up and sand between coats and after last coat as needed to produce a surface free of visual defects, tool marks, and ridges and ready for decoration.
 6. For Level 4 gypsum board finish, embed tape in joint compound and apply first, fill (second), and finish (third) coats of joint compound over joints, angles, fastener heads, and accessories. Touch up and sand between coats and after last coat as needed to produce a surface free of visual defects and ready for decoration.
 7. Where Level 3 gypsum board finish is indicated, embed tape in joint compound and apply first and fill (second) coats of joint compound.
 8. Where Level 2 gypsum board finish is indicated, embed tape in joint compound and apply first coat of joint compound.
 9. Where Level 1 gypsum board finish is indicated, embed tape in joint compound.
- C. Prevent finishes from coming into contact with surfaces not indicated to receive finish by covering them with masking agents, polyethylene film, or other means. If, despite these precautions, finishes contact these surfaces, immediately remove droppings and overspray to prevent damage according to the finish manufacturer's written recommendations.

3.04 BACKING PLATES AND ANCHORS

Backing plates and anchors or blocking which are to be attached to studs or furring for anchoring items and work indicated on the drawings or specified in other Sections shall be installed and secured. Plates and anchors shall be welded or fastened in place in accordance with approved setting drawings.

3.05 CLEANING AND REPAIRING

After installation and before painting, correct surface damage and defects. Leave surface clean and smooth, satisfactory to the painter. painting shall be done over

February 27, 2026

gypsum board work until the joints are thoroughly dry. Joints and fastenings are to be invisible after painting.

END OF SECTION

SECTION 09310 – CERAMIC TILE

PART 1 - GENERAL

1.01 SUMMARY

- A. Work Includes: Complete all tile, accessories, and related work as indicated or required by drawings and as specified herein.
- B. Related Work Described Elsewhere:
 - 1. Sealants are specified under Section 07920 - SEALANTS.
 - 2. Tile backer board is provided under Section 09250 - GYPSUM BOARD ASSEMBLIES.
 - 3. Tile water proofing is specified under Section 09340 - TILE WATERPROOFING.

1.02 SUBMITTALS

- A. Submit under the provisions of Section 01330 - SUBMITTAL PROCEDURES.
- B. Manufacturer's Data: Submit manufacturer's technical information and installation instructions for selected tile, grout, and sealer materials.
- C. Qualification Data: For Installer and Manufacturer.
- D. Shop Drawings: Showing tile and pattern layout, including location and size of movement joints as required by this Section. Drawings include corner and transition details.
- E. Samples:
 - 1. Submit 4 samples each of the various tiles and accessories required to the Architect for approval and for color and pattern selection. Identify samples as to grade and manufacturer. Submit samples of selected tile and color required, not less than 12-inch square, mounted on plywood or hardboard backing, with selected colored grout. Include two or more units in each set of samples showing the full range of appearance characteristics to be expected in completed work.
 - 2. Backer Board: 12-inch square.
- F. Certificate: Before installation of tile, submit to the Architect the Standard Form of Master Grade Certificate signed by the Contractor and Manufacturer, stating grade and kind of tile.
- G. Sealant Compatibility Test Report: From sealant manufacturer, complying with requirements in Section 07920 - SEALANTS and indicating that sealants will not stain or damage tile.
- H. Maintenance Data: For Ceramic Tile, and Porcelain tile to include in maintenance manuals. Include Product Data for stone-care products used or recommended by Installer and names, addresses, and telephone numbers of local sources for products.

- I. Installation Specifications: Submit manufacturer's installation specifications.

1.03 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate ceramic tile similar in material, design, and extent to that indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.
- B. Installer Qualifications: An installer who has completed ceramic tile and stone work similar in material, design, and extent to that indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.
- C. Source Limitations for Other Materials: Obtain each type of grout, tile accessories, sealant, and other material from a single manufacturer for each product.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Deliver all packages of tile to the job in sealed cartons bearing grade seals in compliance with ANSI A1 37.1.
- B. Protect tile, mortar materials and accessories during storage and construction against moisture, soiling, staining, and physical damage.
- C. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

1.05 PROJECT CONDITIONS

- A. Field Measurements: Verify dimensions of construction to receive tile products by field measurements indicate measurements on Shop Drawings.
- B. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

1.06 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
- B. Floor and Wall Tile: Furnish quantity of full-size units equal to 3 percent of amount installed, for each type, composition, color, pattern, and size indicated.

1.07 WARRANTY

- A. Warranty: Warranty for a minimum of 2 years against defects resulting from the use of defective or inferior materials, equipment, or workmanship.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Ceramic Wall and Floor Tiles (CT-01-06): Standard grade, complying with ANSI A 137.1. Submit test reports, from an independent laboratory, indicating conformance of the tile to ANSI A137.1 upon request by the Architect.
 - 1. Slip Resistance: Floor tiles without abrasive content:
 - a. Interior Tile: Dynamic Coefficient of Friction (DCOF) AcuTest value shall not be less than 0.42 in accordance with ANSI A 137.1.
 - b. Exterior Tile: Dynamic Coefficient of Friction (DCOF) AcuTest value shall not be less than 0.60 in accordance with ANSI A 137.1.
 - 2. Ceramic Floor, Wall Tile, and Trims: Dust-pressed, white non-vitreous body with cushion or semi-cushion edges in sizes and finishes as scheduled.
 - 3. Porcelain Tile: Porcelain wall tile and trim shall be glazed, and floor tile unglazed, in size and finish as scheduled.
 - 4. Trim Units: For each type of tile provide all trim shapes as detailed and/or as required. External corners shall be rounded convex unless otherwise noted in the details. Provide other shapes such as curbs, beads, shoes, round out corners and square in corners, etc. to achieve a neat complete installation.

2.02 SETTING MATERIALS

- A. Mortar Bed: Portland Cement Mortar, ANSI 108.02 and as specified below:
 - 1. Portland Cement: ASTM C 150, Type I or II.
 - 2. Aggregate: ASTM C 144.
 - 3. Cleavage Membrane: Polyethelene sheeting, ASTM D 4397, 4.0 mils thick.
 - 4. Reinforcing Wire Fabric: Galvanized, welded wire fabric, 2 by 2-inches by 0.062-inch diameter, comply with ASTM A 185 and ASTM A 82 except for minimum wire size.
- B. Mortar for Patching Existing Mortar Beds: Portland Cement Mortar, ANSI 108.1A and as specified below:
 - 1. Portland Cement: ASTM C 150, Type I or II.
 - 2. Aggregate: ASTM C 144.
- C. Bond Coat and Thin-Set Mortar: Latex-Portland cement mortar, ANSI A118.4, with manufacturer's standard latex additive (water emulsion) serving as a replacement for part or all gauging water.
- D. Large Heavy Tile (LHT), Latex-Portland Cement Mortar: Provide large heavy tile mortar for floor tiles have at least on side dimension greater than 15-inches. Comply with requirements in ANSI A118.4. Provide product that is approved by manufacturer for application thickness of 3/8 inch minimum.
- E. Epoxy Mortar: ANSI A118.3, 100 percent solids, chemical resistant for use in quarry tile applications.

- F. Water: Fresh, clean, and drinkable.

2.03 GROUTING MATERIALS

- A. Manufacturer and Colors as indicated on the Drawings.
 - 1. Polymer-Modified Tile Grout: ANSI A118.7 composed of Portland cement, graded aggregates, polymers, and color-fast pigments; Polyblend manufactured by Custom Building Products.
 - a. Sanded Grout for joints from 1/8-inch to 1/2-inch.
 - b. Un-Sanded Grout for joints less than 1/8-inch.
 - 2. [All ceramic tile grout joints shall be less than 1/8 inch.]

2.04 SEALANTS

- A. Joint Sealants: Manufacturer's standard sealants of characteristics indicated below that comply with applicable requirements in Section 07920 – SEALANTS and will not stain the stone or porcelain tile they are applied to.
 - 1. Single-component, mildew-resistant, neutral curing silicone sealant **[(JS-XX)]** conforming to ASTM C 920 and ASTM C 794, Type S, Grade NS, Use NT, Class 25.
 - 2. Colors: Provide colors of exposed sealants to match colors of grout in stone adjoining sealed joints, unless otherwise indicated.

2.05 MISCELLANEOUS MATERIALS

- A. Solid Surface Threshold: One-piece cast, non-porous, homogeneous blend of UV inhibited polyester-acrylic resin, and randomly dispersed polyester-acrylic and natural minerals as fillers, and is environmentally controlled oven-cured, vacuum mixed, abraded and/or sanded to a non-textured, slip resistant surface; that is not coated, laminated or of composite construction, meeting ANSI Z124.3 & .6.
 - 1. Fabricate threshold to the thickness and profile as indicated on the Drawings and of the appropriate length to fit the scheduled door size.
- B. [Prefabricated Shower Pans: Prefabricated type, presloped, one-piece shower pan with integrated curb with structural ribbing and linear drain; Redi Trench Shower Pan as manufactured by Tile Redi USA. LLC. Fabricate of dimensions and layouts indicated; provide custom layouts where required.
 - 1. **Setting Adhesive: Provide prefabricated shower pan manufacturers multiple part, chemical resistant epoxy setting adhesive, complying with ANSI A118.3; Redi Poxy.**
 - 2. **Provide all manufacturers aluminium sheet wall flashing; Redi Flash.**
 - 3. **Drain Grate: Tileable Drain Grate.]**
- C. Waterproofing Membrane: As specified in Section 09340 – TILE WATERPROOFING.
- D. Crack Isolation Membrane: As specified in Section 09340 – TILE WATERPROOFING.

- E. Transition Strips, Cove Trims and Edge Trim: Edge trims shall be aluminum in sizes as indicated or required by thicknesses of materials including setting materials. Trim shall be Schluter Systems Inc. components or equal.
- F. Tile and Grout Sealer: Colorless, slip, and stain resistant sealer which will not affect color or physical properties of tile or quartz agglomerate surface.
 - 1. 511 Impregnator Sealer as manufactured by Miracle Sealants Company.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates and areas where tile will be installed for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
 - 1. Verify that substrates for setting tile are firm, dry, clean, free of coatings that are incompatible with tile-setting materials including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.
 - 2. Verify that concrete substrates for tile floors installed with thin-set mortar comply with surface finish requirements in ANSI A108.01 for installations indicated.
 - a. Verify that surfaces that received a steel trowel finish have been mechanically scarified.
 - b. Verify that protrusions, bumps, and ridges have been removed by sanding or grinding.
 - 3. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed before installing tile.
 - 4. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.
- B. Report unsatisfactory conditions to the Contractor for corrective measures; send copy of report to the Architect. Do not proceed with installation until unsatisfactory conditions have been corrected. Proceeding with tile work will imply acceptance of the substrate condition by the ceramic tile contractor. Wall substrate must be plumb to within tolerances specified in Section 09250 – GYPSUM BOARD ASSEMBLIES and in complete alignment.

3.02 PREPARATION

- A. Remove coatings that are incompatible with tile-setting materials from substrates, including curing compounds and other substances that contain soap, wax, oil, or silicone.
- B. Vacuum clean concrete substrates to remove dirt, dust, debris, and loose particles.
- C. Patch existing mortar beds that may have been damaged during the removal of existing tile flooring.

- D. For concrete substrates for tile floors installed with thin-set mortar, correct conditions that do not comply with flatness tolerances specified in referenced ANSI A108 Series of tile installation standards.
 - 1. Fill cracks, holes, and depressions with trowelable leveling and patching compound according to tile-setting material manufacturer's written instructions. Use product specifically recommended by tile-setting material manufacturer.
 - 2. Remove protrusions, bumps, and ridges by sanding or grinding.
 - 3. For existing concrete surfaces finished with sealers, remove sealer prior to installation of tile by shot blasting or scarifying the concrete surface to a surface profile recommended by the tile-setting material manufacturer or where waterproofing is indicated by the waterproofing membrane manufacturer. Sweep and vacuum dust and debris.
- E. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.
- F. Install sound impact underlayment and perimeter isolation strips where indicated in strict accordance with the underlayment manufacturer's written instructions.
- G. Install waterproofing membrane, where indicated, in accordance with Section 09340 – TILE WATERPROOFING.

3.03 INSTALLATION, GENERAL

- A. ANSI Tile Installation Standard: Comply with parts of ANSI 108 series of tile installation standards included under "American National Standard Specifications for the Installation of Ceramic Tile" that apply to type of setting and grouting materials and methods indicated.
- B. TCNA Installation Guidelines: TCNA "Handbook for Ceramic Tile Installation"; comply with TCNA installation methods indicated.
- C. Extend tile work into recesses and under or behind equipment and fixtures to form a complete covering without interruptions except as otherwise shown. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- D. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so that plates, collars, or covers overlap tile.
- E. Jointing Pattern: Unless otherwise shown, lay tile in grid pattern. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths unless otherwise shown.
 - 1. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so that extent of each sheet is not apparent in finished work.

- F. Movement Joints: Follow TCNA “Handbook for Ceramic Tile Installation” Section EJ171 Movement Joint Guidelines for Ceramic, Glass and Stone. Provide expansion, control, and pressure-relieving joints of widths and at locations indicated on the Drawings and approved shop drawings. If not shown or indicated, provide movement joints as indicated in the TCNA “Handbook for Ceramic Tile Installation”.
 - 1. Space movement joints a maximum of 12-feet on center with a minimum joint width of 1/2-inch for exterior installations. Joint width may need to increase based on surface temperature of tile in accordance with TCNA EJ171. Movement joint widths for interior installations shall not be less than 1/4-inch.
 - 2. Install perimeter joints where tile abuts restraining surfaces such as perimeter walls, curbs, columns, and changes in plane and corners.
 - 3. Follow TCNA “Handbook for Ceramic Tile Installation” Detail EJ-171 Expansion Joints.
 - 4. Sealing of expansion, control, and pressure-relieving joints is specified in Section 07920 – SEALANTS.
 - 5. Keep expansion, control, and pressure-relieving joints free of plaster, mortar, grout, and other rigid materials.
- G. Grout: Grouts shall comply with ANSI A108.10 for cement grout and ANSI A108.6 for epoxy grout.
- H. Allow tiles to set a minimum of 48 hours prior to grouting. The grout shall be forced into the joints to the full depth. Take special care not to scratch glazed tile during this operation. Remove surplus grout before it has hardened and leave the face of the tile clean. Keep expansion and control joints free of grout.
- I. Sound tiles after setting to ensure proper bonding. Hollow sounding tiles shall be replaced.
- J. Curing Floors: Unless otherwise instructed by thinset and grout manufacturer, apply reinforced kraft paper over floor as soon as pointing or grouting is completed. Lap the paper not less than 6 inches and leave in place for 3 full days. Cure in accordance with applicable ANSI installation procedure.
- K. Tile and Grout Sealer: Apply 1-2 coats to tile and grout in accordance with the manufacturer’s instructions.

3.04 CONSTRUCTION TOLERANCES

- A. Variation in Line: For positions shown in plan for edges of flooring and changes in color or finish, and continuous joint lines, do not exceed 1/8 inch in 96 inches, 1/4 inch in 20 feet, or 3/8 inch maximum.
- B. Variation in Surface Plane of Paving and Flooring: Do not exceed 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 3/8 inch maximum from level or slope indicated.
- C. Variation from Plumb: For vertical lines and surfaces, do not exceed 1/8 inch in 96 inches, 1/4 inch maximum.
- D. Variation in Joint Width: Do not vary joint thickness more than 1/16 inch or one-fourth of the nominal joint width, whichever is less.

- E. Variation in Plane between Adjacent Tiles (Lipping): Do not exceed 1/32-inch difference between planes of adjacent units.

3.05 FLOOR INSTALLATION METHODS

- A. Install types of tile to comply with requirements indicated below for setting bed methods, TCNA installation methods related to types of subfloor construction, and grout types:

1. Latex Portland Cement Mortar (Interior): ANSI A108.5 (Mortar Bed) as indicated.
 - a. On-Ground Concrete: TCNA Installation Method F112 for mortar bed installation on slab-on-grade construction with ANSI A118.4 Latex-Portland cement mortar bond coat. Use LHT mortar for large format tiles.
 - b. Above-Ground Concrete Waterproof Membrane (For areas indicated to receive waterproofing): TCNA Installation Method F122A for waterproofing and tile installation with ANSI A118.4 Latex-Portland cement mortar bond coat. For large format tile with at least one edge dimension over 15-inches use LHT mortar.
2. Grout: Polymer Modified Tile Grout.

- B. Floor Installation

1. Apply thin-set mortar over concrete substrate or cured waterproofing membrane on top of concrete substrate using the appropriate type and size trowel recommended for the size tile by the tile manufacturer. Place only that amount of bonding mortar that can be covered with tile before initial set.
2. Back butter the tiles to ensure 100 percent contact and firmly press tile in the mortar. Move them forward and back, perpendicularly across the ridges, approximately 1/8-inch to 1/4-inch to flatten ridges and fill the valleys.
3. Tamp and beat tile with a wooden block or rubber mallet to obtain full contact with mortar and to bring finished surfaces within indicated tolerances. Set each unit in a single operation before initial set of mortar; do not return to areas already set and disturb tile for purposes of realigning finished surfaces or adjusting joints.
4. Apply LHT mortar for setting large format tiles in accordance with the Ceramic Tile Institute of Americas recommended method and the TCNA.
5. Rake out joints to depth required to receive grout as units are set.

- C. Solid Surface Thresholds: Install solid surface thresholds at locations indicated; Adhere threshold to substrate using silicone sealant per manufacturer's installation instructions. Seal joint between threshold and tile with sealant as specified in Section 07920 – SEALANTS. Threshold installation shall comply with ADAAG Section 4.13.8. Clean as recommended by the manufacturer.

- D. Joint Widths: Install tile on floors with the following joint widths:

1. Ceramic Tile: 1/16-inch, 1/8-inch is acceptable at showers and lanai floors.

3.06 WALL TILE INSTALLATION METHODS

- A. Install types of tile designated for wall application to comply with requirements indicated below for setting-bed methods, TCNA installation methods related to subsurface wall conditions, and grout types:
 - 1. Latex-Portland Cement Mortar: ANSI A108.5.
 - a. Tile Backer Board: TCNA Installation Method W245.
 - 2. Grout:
 - a. Ceramic Tile: Polymer Modified Tile Grout.
 - 3. Wall Installation:
 - a. Apply thin-set mortar over the gypsum tile backer board or waterproofing membrane over gypsum tile backer board at showers and bathtub conditions using the appropriate type and size trowel recommended for the size tile by the tile manufacturer. Place only that amount of bonding mortar that can be covered with tile before initial set.
 - b. Press tile into freshly combed mortar, insuring mortar contact with tile while maintaining joint alignment and spacing. Keep adequate joint depth open for grouting.
 - c. Contact area shall not be less than 80% except in shower walls where contact area shall not be less than 95% when not less than three tile or tile assemblies are removed for inspection.
 - 4. Joint Widths: Install tile on walls with the following joint widths:
 - a. Glazed Wall Tile: 1/16 inch.
- B. Where toilet accessories straddle ceramic tile wainscot and wall surface above, hold tile back from the area where the accessory is to be mounted leaving the wall substrate exposed. Once accessory is mounted finish the tile up to the accessory's edges leaving a 1/4-inch joint between the tile and the accessory edge. Fill joint with sealant as specified in Section 07920 – SEALANTS.

3.07 CONVENTIONAL SHOWER INSTALLATION

- A. Install types of tile to comply with requirements indicated below for setting bed methods, TCNA installation methods related to types of subfloor construction, and grout types:
 - 1. **Latex Portland Cement Mortar (Interior): ANSI A108.5 (Mortar Bed) as indicated**
 - a. **Shower Receptor: TCNA Installation Method B421**
 - 2. **Grout: Polymer Modified Tile grout.**
- B. Install linear shower drain in the location indicated on the drawings following the manufacturers written instructions.
- C. Shower Floor Installation
 - 1. **Install shower pan waterproofing membrane in accordance with Section 09340 – TILE WATERPROOFING.**

2. **Apply thin-set mortar over the waterproofing membrane on top of sloped concrete substrate or mortar bed using the appropriate type and size trowel recommended for the size tile by the tile manufacturer. Place only that amount of bonding mortar that can be covered with tile before initial set.**
 3. **Firmly press tile in the adhesive. Move them forward and back, perpendicularly across the ridges, approximately 1/8-inch to 1/4-inch to flatten ridges, fill the valleys.**
 4. **Back butter the tiles to ensure 100 percent contact and firmly press tile in the mortar. Move them forward and back, perpendicularly across the ridges, approximately 1/8-inch to 1/4-inch to flatten ridges, fill the valleys.**
 5. **Tamp and beat tile with a wooden block or rubber mallet to obtain full contact with mortar and to bring finished surfaces within indicated tolerances. Set each unit in a single operation before initial set of mortar; do not return to areas already set and disturb tile for purposes of realigning finished surfaces or adjusting joints.**
 6. **Rake out joints to depth required to receive grout as units are set.**
- D. **Joint Widths: Install tile on floors with the following joint widths.**
1. **Where mosaic sheets are used, make joints between tile sheets same width as joints within tile sheets so that extent of each sheet is not apparent in finished work.]**

3.08 PREFABRICATED SHOWER PAN INSTALLATION

- A. **Install in accordance with prefabricated shower pan manufacturer's instructions and recommendations and the following:**
1. **Verify that shower pan is aligned properly and fits tight against framing on all sides of the shower.**
 2. **Verify the drainpipe stubbed up from the slab is adjusted to a height sufficient to fit properly into the shower pan drain connection.**
 3. **Apply a 1/2-inch to 3/4-inch mortar bed on the entire area of the shower floor to the edge of the drain hole. Brush PVC or ABS adhesive on the outside of the cut drain pipe and quickly insert into drain connection.**
 4. **Set the shower pan carefully into the mortar bed and the drain housing into the drain hole in the concrete slab. Be sure the drainpipe extends far enough below the subfloor.**
 5. **Firmly press the shower pan into place, making sure there is a good seal between the curb and the subfloor.**
 6. **Verify shower is level in all directions.**
 7. **Install sheet metal wall flashing with upturn leg against the metal wall framing and downturn leg over and down the pan splash walls. Install the shower backer board in accordance with the standards established by the Tile Council of North America, Inc.**

8. **Seal and waterproof joint between backer board and the sheet metal wall flashing over shower pan splash walls.**
 9. **Coordinate and adjust shower pan drain height to accommodate tile and setting bed thickness.**
- B. Shower Floor Installation
1. **Apply pre-fabricated shower pan manufacturer's expoxy setting adhesive over the pre-fabricated shower pan using the appropriate type and size trowel recommended for the size tile by the tile manufacturer. Place only that amount of adhesive that can be covered with tile before initial set.**
 2. **Firmly press tile in the adhesive. Move them forward and back, perpendicularly across the ridges, approximately 1/8-inch to 1/4-inch to flatten ridges, fill the valleys.**
 3. **Tamp and beat tile with a wooden block or rubber mallet to obtain full contact with mortar and to bring finished surfaces within indicated tolerances. Set each unit in a single operation before initial set of mortar; do not return to areas already set and disturb tile for purposes of realigning finished surfaces or adjusting joints.**
 4. **Rake out joints to depth required to receive grout as units are set.**
- C. Joint Widths: Install tile on floors with the following joint widths.
1. **Where mosaic sheets are used, make joints between tile sheets same width as joints within tile sheets so that extent of each sheet is not apparent in finished work.]**

3.09 WATERPROOFING INSTALLATION

- A. Comply with the requirement specified in Section 09340 – TILE WATERPROOFING.

3.10 GROUTING JOINTS

- A. General:
1. Grout Stone, Cermic and Porcelain tile to comply with ANSI A108.10 for cement grout and ANSI A108.6 for epoxy and manufacturer's written instructions, including product technical bulletins and product package instructions.
 2. Remove temporary shims before grouting.
 3. Lightly dampen tile before grouting.
 4. Tool joints uniformly and smoothly with plastic tool.
- B. Flooring:
1. Grout joints as soon as possible after initial set of setting bed. Force grout into joints, taking care not to smear grout on adjoining stone and other surfaces. After initial set of grout, finish joints by tooling to produce a slightly concave polished joint, free of drying cracks.

2. Work grout back and forth at 45-degree angle to the face of tile to ensure complete filling of joints.
 3. During grouting, clean surfaces according to manufacturer's written instructions so they are free of foreign matter.
 4. **[Cure Polymer Modified Tile grout by maintaining in a damp condition for seven days except as otherwise recommended by latex-additive manufacturer.]**
 5. **[Cure grout as recommended by grout manufacturer.]**
- C. [Ceramic Wall Tile:
1. For ceramic wall tile with gloss finish test cement grout on small area prior to using on the entire wall to see if tile surface is scratched by the grout. If scratches occur replace damaged tile and use alternate unsanded tile grout specified in Article 2.03.

3.11 JOINT-SEALANT INSTALLATION

- A. Prepare joints and apply sealants of type and at locations indicated to comply with applicable requirements in Section 07920 – SEALANTS. Remove temporary shims before applying sealants.

3.12 CLEANING AND PROTECTION

- A. Cleaning: Upon completion of placement and grouting, clean all tile surfaces so they are free of foreign matter.
1. Remove grout residue from tile as soon as possible. Clean in accordance with applicable ANSI installation procedure.
 2. Unglazed tile may be cleaned with acid solutions only when permitted by tile and grout manufacturer's printed instructions, but no sooner than 14 days after installation. Protect metal surfaces, cast iron, and vitreous plumbing fixtures from effects of acid cleaning. Flush surface with clean water before and after cleaning.
 3. Remove temporary protective coating by method recommended by coating manufacturer that is acceptable to tile and grout manufacturer. Trap and remove coating to prevent it from clogging drains.
- B. Finished Tile Work: Leave finished installation clean and free of cracked, chipped, broken, unbonded, and otherwise defective tile work.
- C. Provide final protection and maintain conditions in a manner acceptable to manufacturer and installer that ensure that tile is without damage or deterioration at time of Substantial Completion.
1. When recommended by tile manufacturer, apply a protective coat of neutral protective cleaner to completed tile walls and floors. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear.
 2. Prohibit foot and wheel traffic from tiled floors for at least 7 days after grouting is completed.

February 27, 2026

3. Protect tiled corners and external angles with board corner strips in areas used as passageways by workers.
- D. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

END OF SECTION

SECTION 09340 – TILE WATERPROOFING

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes waterproofing for the following applications:
 - 1. Interior Waterproofing Applications: Showers, walls and under tile at restroom floors.
 - 2. The waterproofing shall not allow for the passage of water through the waterproofing membrane.
 - 3. Fully coordinate with mechanical systems. All MEP penetrations through waterproofing, such as mixing valves, shall be coordinated with waterproofing, sheathing and tile so that they can be flashed watertight and not rely solely on sealant at the face of the tile to provide for the primary waterproofing.

1.02 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Shop Drawings: Show extent of each type of waterproofing. Include details for treating substrate joints and cracks, flashings, deck penetrations, and other termination conditions. Any details included in the project documents are intended to be representational of the waterproofing systems at tile areas. The manufacturer and installer shall provide project specific details for each system and that represent all project conditions, including custom fabrications of premanufactured items if required.
- C. Samples for Verification: For each type of waterproofing required, prepared on rigid backing and of same thickness and material indicated for the Work.
 - 1. Provide stepped Samples on backing large enough to illustrate buildup of waterproofing.
- D. Qualification Data: For Installer.
- E. Material Test Reports: For each type of waterproofing.
- F. Material Certificates: For each type of waterproofing, signed by manufacturers.
- G. Field quality-control test reports.
- H. Maintenance Data: For waterproofing (as applicable) to include in maintenance manuals. Identify substrates and types of waterproofing applied. Include recommendations for periodic inspections, cleaning, care, maintenance, and repair of waterproofing membranes.
- I. Warranty: Special warranty specified in this Section.
- J. All items per 1.03.

1.03 QUALITY ASSURANCE & PERFORMANCE REQUIREMENTS

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of waterproofing required for this Project. This firm

February 27, 2026

must demonstrate not less than 5 years successful experience in installation of work similar to the work of this project. Credential and substantiating data must be submitted to the Architect.

- B. Source Limitations:
 - 1. Obtain all waterproofing types from a single manufacturer.
 - 2. Obtain primary waterproofing materials, including primers, from a single manufacturer. Obtain secondary materials including sheet flashings, joint sealants, and substrate repair materials from primary material manufacturer or of type and from source recommended in writing by primary material manufacturer.
- C. Regulatory Requirements: Provide products that comply with local regulations controlling use of volatile organic compounds (VOCs).
- D. Materials shall comply with the following Standards:
 - 1. ASTM - American Society for Testing and Materials
 - a. ASTM C 627 - Standard Test Method for Evaluating Ceramic Floor Tile Installation Systems Using the Robinson-Type Floor Tester.
 - b. ASTM D 4068 - Standard Specification for Chlorinated Polyethylene (CPE) Sheeting for Concealed Water-Containment Membrane.
 - c. ASTM E 96 - Standard Test Methods for Water Vapor Transmission of Materials.
 - 2. ANSI – American National Standards Institute:
 - a. ANSI A108.13 – Installation of Load Bearing, Bonded, Waterproof Membranes for Thinset Ceramic Tile and Dimension Stone.
 - b. ANSI A118.10 – American National Standard Specification for Load Bearing, Bonded, Waterproof Membranes for Thinset Ceramic Tile and Dimension Stone Installation.
 - 3. IAPMO – International Association of Plumbing and Mechanical Officials.
- E. Membrane shall have maximum Moisture Vapor Permeance of 0.15 perms when tested in accordance with ASTM E 96 Procedure E.
- F. Membrane must have UPC and IPC ratings as shower pan receptor waterproofing.
- G. ANSI A108 Standards and TCNA recommendations shall be incorporated into work of this section.
- H. Fully coordinate all work of this section with tile installation and all other adjacent materials.
- I. Before submitting bids for work of this section, review all aspects and details of installation with the manufacturer to ensure that systems noted are the most appropriate and will function in concert with adjacent materials. Provide those materials and systems, if not noted, as recommended by the manufacturer to achieve a watertight condition at all installation areas.
- J. Preinstallation Conference: Conduct conference at Project site.

February 27, 2026

1. Before installing waterproofing, meet with representatives of authorities having jurisdiction, manufacturer's technical representative, Architect, consultants, independent testing agency, and other concerned entities. Review requirements for traffic coatings. Notify participants at least seven days before conference.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages and containers with seals unbroken and bearing manufacturer's labels showing the following information:
 1. Manufacturer's brand name.
 2. Type of material
 3. Directions of manufacture and shelf life.
 4. Lot or batch number.
 5. Mixing and application instructions.
 6. Color.
- B. Store materials in a clean, dry location protected from exposure to direct sunlight. In storage areas, maintain environmental conditions within range recommended in writing by manufacturer.

1.05 PROJECT CONDITIONS

- A. Environmental Limitations: Apply waterproofing materials within the range of ambient and substrate temperatures recommended in writing by manufacturer. Do not apply waterproofing to damp or wet substrates.
- B. Do not install waterproofing until items that will penetrate membrane have been installed.

1.06 WARRANTY

- A. Special Warranty for Interior Tile Waterproofing: Manufacturer's standard form in which manufacturer agrees to repair or replace waterproofing materials that deteriorate during the specified warranty period.
 1. Deterioration of waterproofing includes the following:
 - a. Rotting
 - b. Cracking
 - c. Microorganism Deterioration
 2. Warranty Period: Life of the original installation.

PART 2 - PRODUCTS

2.01 INTERIOR TILE WATERPROOFING

- A. Material Compatibility: Provide primers, sealants and miscellaneous materials that are compatible with one another and with substrate under conditions of

- service and application, as demonstrated by manufacturer based on testing and field experience.
- B. Under Tile Waterproofing for Interior Applications: ANSI A118.10; composite sheet membrane made from an alloy of non-plasticized chlorinated polyethylene (CPE) with non-woven fiber laminated to both sides, 0.030-inch nominal thickness.
 - C. Products: Subject to compliance with requirements, provide one of the following: Noble Company, Nobleseal TS (Basis of Design) or approved equal.
 - 1. Pre-manufactured items for Interior Waterproofing: Whenever possible, utilize manufacturer's pre-manufactured items such as corners, curbs and other similar items.
 - D. Miscellaneous Materials
 - 1. Bonding Mortar: Latex-Portland cement mortar, ANSI A118.4, with manufacturer's standard latex additive (water emulsion) serving as a replacement for part or all of gauging water.
 - E. Seam Sealants: Manufacturer's thermoplastic, high-solid, synthetic co-polymer rubber sealant; NobleSealant 150.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements and for other conditions affecting performance of waterproofing membranes.
 - 1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance.
 - 2. Verify compatibility with and suitability of substrates.
 - 3. Verify that substrates are visibly dry and free of moisture if recommended by manufacturer.
 - a. Test for moisture vapor transmission by plastic sheet method according to ASTM D 4263 if recommended by waterproofing manufacturer.
 - b. Test for moisture content by method recommended in writing by manufacturer.
 - 4. Application of waterproofing indicates acceptance of surfaces and conditions.

3.02 PREPARATION

- A. General: Before applying waterproof membranes, clean and prepare substrates according to manufacturer's written instructions to produce clean, dust-free, dry substrate for waterproof membrane application.
- B. Mask adjoining surfaces not receiving waterproofing, deck drains, and other deck substrate penetrations to prevent spillage, leaking, and migration of waterproofing materials.

- C. Substrates: Prepare surfaces to receive waterproofing per requirements and limitations of waterproofing materials and per manufacturer's recommendations.

3.03 INTERIOR TILE WATERPROOFING INSTALLATION

A. Waterproofing Application

1. Apply waterproofing systems per TCNA guidelines, ANSI requirements and per manufacturer's recommendations and in concert with tile systems to provide for a watertight condition at all areas where waterproofing is installed.
2. Spread bonding mortar with appropriate size trowel as recommended by the manufacturer to achieve full contact of membrane to substrate. Trowel an area as wide as the sheet and as far as can be comfortably reached. Trowel mortar in parallel rows across the wide or length of the sheet to avoid trapped air pockets under the membrane.
3. Unroll sheet into bonding mortar before mortar skins over and embed membrane using a rubber hand roller or flat side of trowel.
4. Prior to curing lift sheet and inspect for full contact.
5. Seaming: Where seams are required seam wall membrane together with 2-inch overlaps with the upper edge towards the direction of the drainage. Apply a 3/16-inch continuous bead of seam sealant, without skips or gaps, 3/4-inch from the edge of the sheet being overlapped. Overlap sheets and flattened seam with roller or flat side of trowel.
6. Turn sheet membrane installed on floors up vertical surfaces minimum 2-inches higher than finished floor and bond to substrate,
7. Drains: Install membrane manufacturer's drain flashing sheet in accordance to the manufacturer's written instructions. Locate drain and cut a hole in the waterproofing membrane to the size so as to overlap the drain flashing membrane 2-inches. Seam the waterproofing membrane to the drain flashing by applying a 3/16-inch continuous bead of seam sealant, without skips or gaps, 3/4-inch from the edge of the drain flashing. Flattened seam with roller or flat side of trowel.

B. Shower Walls Membrane Installation: Install sheet membrane over tile backer board up to the height of the shower head.

1. At interface of wall membrane to shower pan lap wall membrane over shower pan upturn by 2-inches shingle fashion in the direction of water drainage using the aforementioned seaming method.
2. If required seam wall membrane in the same fashion as the aforementioned seaming method.

C. Terminations, Corners and Penetrations:

1. Install manufacturer's pre-manufactured corners, end dams, and flashings at penetrations and hardware (custom fabricated if required). Use the aforementioned seaming procedure to weld on corners, end dams, and flashings.

February 27, 2026

3.04 FIELD QUALITY CONTROL

- A. Final Waterproofing Inspection: Arrange for manufacturer's technical personnel to inspect membrane installation on completion.
 - 1. Notify the Architect 48 hours in advance of date and time of inspection.
- B. Water Testing:
 - 1. Upon completion of sheet membrane waterproofing installation for each floor application perform water testing per guidelines established by ASTM D 5957 for a period of 24 hours.
 - a. Inspect waterproofing for leaks.
 - b. Repair leaks and re-test until watertight
 - 2. Coordinate testing with general contractor and monitor at all times to prevent damage to the structure if there is failure. If failures occur, testing shall take place until such time that all areas pass water test. Testing shall be documented in writing and presented for acceptance of successful water testing.

3.05 PROTECTING AND CLEANING

- A. Protect waterproofing from damage and wear during remainder of construction period.
- B. Clean spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION

SECTION 09510 – SUSPENDED ACOUSTICAL CEILING

PART 1 - GENERAL

1.01 WORK INCLUDES

- A. Acoustical Ceiling Systems
 - 1. Acoustical Ceiling Tiles.
 - 2. Exposed grid suspension system.
 - 3. Wire hangers, fasteners, main runners, cross tees, and wall angle moldings.

1.02 RELATED SECTIONS

- A. Section 07920 – SEALANTS for acoustical sealant.
- B. Section 15855 – DIFFUSERS, REGISTERS AND GRILLES for air diffusion devices.
- C. Section 16500 –LIGHTING for light fixtures.
- D. Section 16721 – FIRE ALARM SYSTEM for fire alarms and smoke detectors.

1.03 REFERENCES

- A. ASTM C 635 - Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
- B. ASTM C 636 - Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.

1.04 SYSTEM REQUIREMENTS

- A. Structural Characteristics: Suspension system to rigidly secure acoustical ceiling system including integral mechanical and electrical components with maximum deflection of L/360.
 - 1. Classification: ASTM C 635 Intermediate Duty Class.
 - 2. Attachment Devices: Size for five times design load indicated in ASTM C 635, Table 1, "Direct Hung" unless otherwise indicated. Comply with seismic design requirements.
- B. Fire Performance Characteristics: Identify acoustical ceiling components with appropriate markings of applicable testing and inspecting organization.
 - 1. Surface Burning Characteristics: Acoustical ceiling components shall comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency. Comply with ASTM E 1264 for Class B materials.
 - a. For Class B materials: Flame Spread: 26 – 75.
 - b. For Class B materials: Smoke Developed: 0 - 450.
- C. Acoustical Performance:

February 27, 2026

1. Acoustical Panel (ACT-01):
 - a. Noise Reduction Coefficient (NRC): 0.80
 - b. Ceiling Attenuation Class (CAC): 35
- D. Seismic Requirements:
 1. Acoustical ceiling system to be install in accordance with ASTM E 580 "Practice for Application of Acoustical Suspension Systems for Acoustical Tile and Lay-In Panels in Areas Requiring Seismic Resistance".
 - a. Seismic Zone: As determined by 2018 IBC.
- E. Optical Performance:
 1. Acoustical Panel - Light Reflectance (LR) per ASTM E 1477: 0.86 or greater.
- F. Source Limitations: Obtain each type of acoustical ceiling tile and supporting suspension system through one source from a single manufacturer.

1.05 SUBMITTALS

- A. Samples: Minimum 6 inch x 6 inch samples of each specified acoustical panel; 8 inch long samples of exposed wall molding and suspension system, including main runner and 4 foot cross tees.
- B. Shop Drawings: Layout and details of acoustical ceilings. Show locations of items which are to be coordinated with, or supported by the ceilings.
- C. Certifications: Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards. For acoustical performance, each carton of material must carry an approved independent laboratory classification of NRC.
- D. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
- E. Warranties: Special warranties specified in this Section.

1.06 QUALIFICATIONS

- A. Grid Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum ten years documented experience.
- B. Acoustical Unit Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum ten years documented experience.

1.07 COORDINATION

- A. Coordinate acoustical ceiling work with installers of related work including, but not limited to building insulation, gypsum board, light fixtures, mechanical systems, electrical systems, and sprinklers.

1.08 PROJECT CONDITIONS

- A. Space Enclosure: Do not install interior ceilings until space is enclosed and weatherproof; wet work in place is completed and nominally dry; work above

February 27, 2026

ceilings is complete; and ambient conditions of temperature and humidity are continuously maintained at values near those intended for final occupancy. Building areas to receive ceilings shall be free of construction dust and debris.

1.09 EXTRA MATERIALS

- A. Extra Materials: For each type, furnish extra materials described below that match products installed. Packaged with protective covering for storage and identified with appropriate labels.
 - 1. Acoustical Ceiling Units: Furnish quantity of full-size units equal to 5.0 percent of amount installed.
 - 2. Exposed Suspension System Components: Furnish quantity of each exposed suspension component equal to 2.0 percent of amount installed.

1.10 WARRANTY

- A. Acoustical Tiles: Submit a written warranty executed by the manufacturer, agreeing to repair or replace acoustical tiles that fail within the warranty period. Failures include, but are not limited to:
 - 1. Acoustical Tiles: Sagging and warping.
 - 2. Grid System: Rusting and manufacturer's defects
- B. Warranty Period:
 - 1. Acoustical Tiles: One (1) year from date of substantial completion.
 - 2. Grid: Ten (10) years from date of substantial completion.
- C. The Warranty shall not deprive the Owner of other rights they may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Products described in this Section are products of Armstrong World Industries, Inc. Products of one of the following manufacturers are acceptable subject to visual comparability and the requirements of this Section.
- B. Suspension System:
 - 1. USG Interiors, Inc.
 - 2. Rockfon
 - 3. CertainTeed
 - 4. Or approved equal
- C. Acoustical Tile Units:
 - 1. USG Interiors, Inc.
 - 2. Rockfon

February 27, 2026

3. CertainTeed
4. Or approved equal.

2.02 ACOUSTICAL CEILING TILE TYPES

- A. Type (ACT-01, 02): Mineral fiber, wet-formed with factory applied latex paint, protected to prevent sag when air conditioning is not in use and containing a bioblock to prevent mildew.
 1. Size: As indicated.
 2. Pattern: 1445 Ultima Health Zone, Square Lay-in, fine texture as manufactured by Armstrong World Industries or approved equal.
 3. Classification: ASTM E 1264, Type IV, Form 2, Pattern E, Fire Class A.
- B. Provide ceiling tiles that are SCS Indoor Advantage Gold or UL Greenguard Gold certified and qualify as low VOC emitting material.

2.03 SUSPENSION SYSTEMS

- A. Main beams and cross tees shall be hot dipped galvanized steel per ASTM A 653 and finished with baked on polyester paint, color to match the actual color of the selected ceiling tile.
 1. Style for ACT-01, 02: Prelude 15/16" Exposed Tee, ASTM C 635 rating of Heavy Duty as manufactured by Armstrong World Industries, Inc.]
 2. Style for ACT-01: Clean Room 15/16" Exposed Tee, ASTM C 635 rating of Intermediate Duty, co-extrude aluminum, gasketed as manufactured by Armstrong World Industries, Inc.
- B. Edge Moldings and Trim: Of types and profiles indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations, including light fixtures, that fit type of edge detail and suspension system indicated. Provide moldings with exposed flange of the same width as exposed runner. Finish to match exposed tees.
 1. Provide Armstrong 6" Axiom Classic Trim at ceiling elevation changes with spring border clip as detailed.
- C. Wire for Hangers and Ties: ASTM A 641, Class I zinc coating, soft temper, prestretched, with a yield stress load of at least three times the design load, but not less than 12 gauge.

2.04 ACCESSORIES

- A. Touch-up Paint: Type and color to match acoustical and grid units.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify site conditions.
- B. Verify that layout of hangers will not interfere with other work.

3.02 INSTALLATION GRID SUSPENSION SYSTEM

- A. Install suspension system in accordance with ASTM C 636 and as supplemented in this section. Install suspension system to comply with the seismic requirements indicated, per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook".
- B. Locate system on room axis according to reflected plan.
- C. Install after major above-ceiling and wet work is complete and humidity levels are stabilized in the building. Coordinate the location of hangers with other work.
- D. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
- E. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
- F. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
- G. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
- H. Space hangers not more than 48 inches o.c. along each member supported directly from hangers, unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
- I. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability. Support fixture loads by supplementary hangers located within 6 inches of each corner; or support components independently.
- J. Do not eccentrically load system or produce rotation of runners.
- K. Install edge molding at intersection of ceiling and vertical surfaces, using longest practical lengths. Miter corners. Provide edge moldings at junctions with other interruptions.
 - 1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
 - 2. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet.
- L. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

3.03 INSTALLATION - ACOUSTICAL UNITS

- A. Install acoustical units in accordance with manufacturer's instructions.
- B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.

February 27, 2026

- C. Lay directional patterned units one way with pattern parallel to longest room axis. Fit border trim neatly against abutting surfaces.
- D. Install units after above ceiling work is complete.
- E. Install acoustical units level, in uniform plane, and free from twist, warp and dents.
- F. Cut panels to fit irregular grid and perimeter edge trim. Field rabbet edge. Double cut and field paint exposed edges of tegular units.
- G. Where round obstructions occur, provide preformed closers to match edge molding.

3.04 ERECTION TOLERANCES

- A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.
- B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION

February 27, 2026

SECTION 09545 – SUSPENDED WOOD CEILING

PART 1 - GENERAL

1.01 SUMMARY

- A. The Work in this section includes:
 - 1. Wood Grille Ceiling.
 - 2. Concealed T-bar suspension system.
 - 3. Wire hangers, fasteners, main runners, cross tees, and wall angle moldings.
- B. Related Sections include the following
 - 1. Section 07210 – BUILDING INSULATION for acoustical panel board insulation.
 - 2. Section 07920 – SEALANTS for acoustical sealant.
 - 3. Section 15855 – DIFFUSERS, REGISTERS AND GRILLES for air diffusion devices.
 - 4. Section 16500 – LIGHTING for light fixtures
 - 5. Section 16721 – FIRE ALARM SYSTEM for fire alarms and smoke detectors.

1.02 SYSTEM REQUIREMENTS

- A. Structural Characteristics: Suspension system to rigidly secure wood panel ceiling system including integral mechanical and electrical components with maximum deflection of 1/360,
 - 1. Classification: ASTM C 635 Heavy Duty Class.
 - 2. Attachment Devices: Size for three times design load indicated in ASTM C 635, Table 1, "Direct Hung" unless otherwise indicated. Comply with seismic design requirements.
- B. Fire Performance Characteristics: Identify acoustical ceiling components with appropriate markings of applicable testing and inspecting organization.
 - 1. Surface Burning Characteristics: As follows, tested per ASTM E 84 and complying with ASTM E 1264 for Class B products.
 - a. Flame Spread: 26 - 75
 - b. Smoke Developed: 0 - 450
- C. Seismic Requirements:
 - 1. Acoustical ceiling system to be install in accordance with ASTM E 580 "Practice for Application of Acoustical Suspension Systems for Acoustical Tile and Lay-In Panels in Areas Requiring Seismic Resistance".
 - a. Seismic Criteria: As determined by 2018 IBC and/or indicated on the Structural Drawings.

1.03 SUBMITTALS

- A. Samples: Minimum 12 inches wide x 24 inches long samples of specified wood grille panel; 8 inch long samples of exposed wall molding and suspension system, including main runner and 4 foot cross tees.
- B. Shop Drawings: Layout and details of wood grille ceilings. Show locations of items which are to be coordinated with, or supported by the ceilings.
- C. Certifications: Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards.
- D. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
- E. Warranties: Special warranties specified in this Section.

1.04 QUALIFICATIONS

- A. Grid Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum ten years documented experience.
- B. Wood Ceiling Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum ten years documented experience.

1.05 COORDINATION

- A. Coordinate wood grille ceiling work with installers of related work including, but not limited to building insulation, gypsum board, light fixtures, mechanical systems, electrical systems, and sprinklers.
- B. Coordinate the placement of the acoustical panel insulation units as specified in Section 07210 – BUILDING INSULATION with the installation of the suspended wood grille ceiling panels.

1.06 PROJECT CONDITIONS

- A. Space Enclosure: Do not install wood panel ceilings until space is enclosed and weatherproof; wet work in place is completed and nominally dry; work above ceilings is complete; and ambient conditions of temperature and humidity are continuously maintained at values near those intended for final occupancy. Building areas to receive ceilings shall be free of construction dust and debris.

1.07 EXTRA MATERIALS

- A. Extra Materials: Furnish extra materials described below that match products installed. Packaged with protective covering for storage and identified with appropriate labels.
 - 1. Wood Grille Ceiling Units: For each type, furnish quantity of full-size units equal to 10.0 percent of amount installed.
 - 2. Concealed Suspension System Components: Furnish quantity of each exposed suspension component equal to 2.0 percent of amount installed.

February 27, 2026

1.08 WARRANTY

- A. Wood Grille Ceiling Panel: Submit a written warranty executed by the manufacturer and Contractor, agreeing to repair or replace wood grille panels that fail within the warranty period.
- B. Grid Suspension System: Submit a written warranty executed by the manufacturer and Contractor covering the suspension system from rusting and manufacturer's defects.
- C. Warranty Period:
 - 1. Wood Grille Ceiling Panels: One (1) year from date of Substantial Completion.
 - 2. Grid Suspension System: Ten (10) years from date of Substantial Completion.
- D. The Warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Products described in this Section are products of the following manufacturer's:.
- B. Suspension System:
 - 1. Donn/U.S. Gypsum Interiors, Inc.
 - 2. Or approved equal.
- C. Wood Grille Ceiling and Wall Panels:
 - 1. 9Wood, Inc.
 - 2. Or approved equal.

2.02 WOOD CEILING AND WALL PANELS

- A. Wood Ceiling Panel (WD-01): Constructed from solid hardwood members 3/4-inch thick by 1-3/8-inches deep, having 4 members per linear foot secured and reinforced with solid hardwood cross piece backer (painted black) laying across each member and spaced 12-inches o.c. perpendicular to members.
 - 1. Panel Size: 12-inches by 96-inches (Nominal)
 - 2. Pattern: 1100 Cross Piece Grille as scheduled on the Drawings
 - 3. Wood Species: As scheduled.
 - 4. Edge Profile: Square
 - 5. Finish and Stain: As Scheduled.

February 27, 2026

2.03 SUSPENSION SYSTEMS

- A. Main beams and cross tees shall be hot dipped galvanized steel per ASTM A 653 and finished with baked on polyester paint.
 - 1. Style: Concealed main tee Model No. DX24-10 and cross tee Model No. DX424 by Donn/U.S. Gypsum Interiors.
 - 2. Beam and Cross Tee Colors:
 - a. At Stained or Transparent Wood Grille Finish: Black
- B. Edge Moldings and Trim: Wall molding M7 for edges and penetrations, including light fixtures, that fit type of edge detail and suspension system indicated. Provide moldings with exposed flange of the same finish and color as concealed tees.
- C. Wire for Hangers and Ties: ASTM A 641, Class I zinc coating, soft temper, prestretched, with a yield stress load of at least three times the design load, but not less than 12 gauge.
- D. Seismic Struts: Manufacturer's standard compression struts designed to accommodate lateral forces.
- E. Seismic Clips: Manufacture's standard seismic clips designed and placed to secure acoustical tiles in place.

2.04 ACCESSORIES

- A. Touch-up Paint: Type and color to match molding units.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that layout of hangers will not interfere with other work.

3.02 INSTALLATION SUSPENSION SYSTEM

- A. Install suspension system in accordance with ASTM C 636 and as supplemented in this section. Install suspension system to comply with the seismic requirements indicated, per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."
- B. Locate system on room axis according to reflected plan.
- C. Install after major above ceiling and wet work is complete. Coordinate the location of hangers with other work.
- D. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
- E. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
- F. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability. Support fixture loads by

February 27, 2026

supplementary hangers located within 6 inches of each corner; or support components independently.

- G. Do not eccentrically load system, or produce rotation of runners.
- H. Install edge molding at intersection of ceiling and vertical surfaces, using longest practical lengths. Miter corners. Provide edge moldings at junctions with other interruptions.

3.03 INSTALLATION – WOOD CEILING PANELS

- A. Install wood panels in accordance with manufacturer's instructions.
- B. Fit panels in place, free from damaged edges or other defects detrimental to appearance and function.
- C. Lay wood panels in direction as indicated on the reflected ceiling plans. Fit border trim neatly against abutting surfaces. Fasten panels to metal suspension tees by screwing through the wood backers into the main and cross tees. For the interior panels and attached panels to soffit framing at exterior soffit conditions.
- D. Install units after above ceiling work is complete.
- E. Install wood grille panels level, in uniform plane, and free from twist, warp and dents.
- F. Cut panels to fit irregular grid and perimeter edge trim.
- G. Where round obstructions occur, provide preformed closers to match edge molding.

3.04 ERECTION TOLERANCES

- A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.
- B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

3.05 CLEANING

- A. After installation of ceiling, all strips shall be cleaned and free of dust, dirt fingerprints.

END OF SECTION

February 27, 2026

SECTION 09651 – RESILIENT FLOORING

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes the following:
 - 1. Sheet Vinyl Flooring
 - 2. Resilient Wall Base

1.02 SUBMITTALS

- A. Product Data: Submit manufacturers data, installation instructions, and maintenance manuals for each type of resilient flooring and wall base.
- B. Samples for Verification: Physical samples of each different color and pattern of flooring system and wall base specified, showing the full range of variations expected in these characteristics.
- C. For Tiled Resilient Flooring: Heat-Welded Seam Samples: For each flooring product and welding bead color and pattern combination required; with seam running lengthwise and in center of 6-by-9-inch Sample applied to a rigid backing and prepared by Installer for this Project.

For Seamless Resilient Flooring: Seam Samples: For seamless-installation technique indicated and for each floor covering product, color, and pattern required; with seam running lengthwise and in center of 6-by-9-inch Sample applied to a rigid backing and prepared by Installer for this Project.
- D. Product Certificates: Signed by manufacturers of resilient products certifying that each product furnished complies with requirements, are suitable for the intended use, and are compatible with the substrates and underlayments to which they are being applied.

1.03 QUALITY ASSURANCE

- A. Manufacturer: Provide flooring by a firm with a minimum of 10 years experience in the production of resilient flooring of the type equivalent to that specified.
- B. Installer Qualifications: Engage an experienced installer with a minimum of 2 years experience to perform work of this Section who has specialized in installing resilient flooring products similar to those required for this Project and with a record of successful in-service performance.
- C. Source Limitations: Obtain each type, color, and pattern of product specified from one source with resources to provide products of consistent quality in appearance and physical properties without delaying the Work.
- D. Slip Resistance: Flooring products shall have a static coefficient of slip resistance in excess of 0.6 when tested in accordance with ASTM D 2047.

- E. Fire-Test-Response Characteristics: Provide products with the following fire-test response characteristics as determined by testing identical products per test method indicated below by a testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Critical Radiant Flux: Class 1, 0.45 W/sq. cm or greater when tested per ASTM E 648.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to Project site in manufacturer's original, unopened cartons and containers, each bearing names of product and manufacturer, Project identification, and shipping and handling instructions.
- B. Store products in dry spaces protected from the weather, with ambient temperatures maintained between 50 and 90 deg F.
- C. Store rolls upright and tiles on flat surfaces.
- D. Move products into spaces where they will be installed at least 48 hours before installation, unless longer conditioning period is recommended in writing by manufacturer.

1.05 PROJECT CONDITIONS

- A. Maintain a temperature of 70 deg F plus or minus 5 deg F in spaces to receive products for at least 48 hours before installation, during installation, and for at least 48 hours after installation, unless manufacturer's written recommendations specify longer time periods. After post-installation period, maintain a temperature of not less than 55 deg F or more than 95 deg F.
- B. Do not install products until they are at the same temperature as the space where they are to be installed.
- C. Close spaces to traffic during flooring installation and for time period after installation recommended in writing by manufacturer.
- D. Install flooring and accessories after other finishing operations, including painting, have been completed.
- E. Do not install flooring over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive, as determined by flooring manufacturer's recommended bond and moisture test.

1.06 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels describing contents.
 - 1. Furnish not less than one box for each 50 boxes or fraction thereof, or not less than 2% of total installed, whichever is less, of each type, color, pattern, and size of resilient flooring material installed.
 - 2. Furnish not less than 10 linear feet for each 500 linear feet or fraction thereof, of each type, color, pattern, and size of resilient wall base installed.

February 27, 2026

3. Deliver extra materials to Owner.

1.07 WARRANTY

- A. Provide manufacturer's warranty against defects in manufacturing and workmanship of resilient flooring for periods listed below:
 1. Sheet Vinyl Flooring: Five (5) years from the Date of Substantial Completion.
 2. Resilient Wall Base: Two (2) years from the Date of Substantial Completion.
- B. Provide manufacturer's limited warranty against wear for a period of 2 years from the Date of Substantial Completion.

PART 2 - PRODUCTS

2.01 ASBESTOS PROHIBITION

- A. No asbestos containing materials or equipment shall be used in this section. The Contractor shall ensure that all materials and equipment incorporated in the project are asbestos-free.

2.02 MANUFACTURERS AND PRODUCTS

- A. Sheet Vinyl Flooring (RF-01 & 02): ASTM F 1913
 1. Resilient flooring composed of homogeneous sheet vinyl with UV cured slip resistant polyurethane wear layer.
 - a. Type 1, Grade 1.
 - b. Pattern Repeat:
 - i. RF-01: 36" L x 72" W
 - ii. RF-02: 48" L x 48" W
 - c. Overall Thickness: 0.080-inch
 - d. Wear-Layer Thickness: 0.020-inch
 - e. Slip Resistance: Static Coefficient of Friction <0.6 as tested in accordance with ASTM D2047.
 - f. Static Load Limit: ASTM F 970, 250psi.
 2. Seaming Method: Heat Welded
 3. Color and Pattern: As scheduled.
- B. Sheet Vinyl Flooring (RF-03): ASTM F 1913
 1. Resilient flooring composed of homogeneous sheet vinyl with UV cured slip resistant polyurethane wear layer.
 - a. Type 1, Grade 1.
 - b. Pattern Repeat: 36" L x 72" W
 - c. Overall Thickness: 0.080-inch

February 27, 2026

- d. Wear-Layer Thickness: 0.020-inch
- e. Slip Resistance: Static Coefficient of Friction <0.6 as tested in accordance with ASTM D2047.
- f. Static Load Limit: ASTM F 970, 250psi.
- 2. Seaming Method: Heat Welded
- 3. Color and Pattern: As scheduled.
- C. Resilient Wall Base (RB-01): ASTM F 1861
 - 1. Resilient base shall be thermoplastic, solid homogeneous rubber.
 - a. Type TP, Group 1.
 - b. Color and size as indicated on the Drawings. Provide in manufacturer's standard lengths.
 - c. Provide coved toe base and pre-molded outside and inside corners.

2.03 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, Portland cement based, or blended hydraulic cement-based formulation having zero VOC provided or approved by floor covering manufacturer for applications indicated.
- B. Adhesives: Brush-on, roll-on, or trowel on water-resistant type recommended by manufacturer to suit resilient products, substrate conditions, and type of use indicated.
 - 1. Adhesive shall be solvent-free with zero VOC content, low-odor, no ammonia, and non-flammable in wet state.
- C. Heat Welding Bead: Solid-strand product of floor covering manufacturer. Color to match flooring.
- D. Sealers and Wax: Types recommended by flooring manufacturer.
- E. Edge Strips: Where required for these applications, manufacturer's standard for the flooring system selected.
- F. Vapor Retarder (Where Required): Two-part, fluid-applied, epoxy-based membrane compatible with flooring adhesive.
 - 1. Slab-Cote Extreme Moisture Vapor Barrier Coating as manufactured by Bostik, Inc.
 - 2. Drytek Moisture Vapor Barrier as manufactured by Laticrete
 - 3. Vapor Seal – HM as manufactured by Dependable Floor Products
 - 4. Or approved equal.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions where installation of resilient products will occur, with Installer present, for compliance with manufacturer's

- requirements. Verify that substrates and conditions are satisfactory for resilient product installation and comply with requirements specified.
- B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710 and the following:
1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that may act as a bond breaker. Substrate surface shall be smooth and flat to within 1/8 inch per 10 feet.
 2. Slab, regardless of age and grade level, shall be tested for moisture vapor emissions in accordance with ASTM F 1869 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Sub-floor Using Anhydrous Calcium Chloride. One test shall be conducted for every 1000 square feet of flooring and the results shall not exceed 3 pounds per 100 square feet per 24 hours.
 3. Perform alkalinity and adhesion tests recommended in writing by manufacturer.
 4. Subfloor finishes comply with requirements of the flooring manufacturer for slabs receiving resilient flooring.
 5. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.
- C. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. General: Comply with resilient product manufacturer's written installation instructions for preparing substrates indicated to receive resilient products.
- B. If the vapor emission rate at the time of installation is found to exceed to required rate for floor covering installation, and it is determined and agreed upon by the Contractor and Architect that the vapor emission rate will not improve apply the specified vapor retarder in strict accordance with the manufacturer's written instructions.
- C. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, and depressions in substrates. Substrate tolerance: level to within 1/8" in 10' at all locations.
- D. Remove coatings, including curing compounds, and other substances that act as bond breakers and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
- E. Broom and vacuum clean substrates to be covered immediately before product installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust.

3.03 GENERAL FLOORING INSTALLATION

- A. General: Comply with flooring manufacturer's written installation instructions.

February 27, 2026

- B. Scribe, cut, and fit floor covering to butt neatly and tightly to vertical surfaces and permanent fixtures, including built-in furniture, cabinets, pipes, outlets, edgings, door frames, thresholds, and nosings.
- C. Extend floor covering into toe spaces, door reveals, closets, and similar openings.
- D. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use chalk or other non-permanent, non-staining marking device.
- E. Adhere floor coverings to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.
- F. Place resilient transition moldings tightly butted to flooring and secure with adhesive recommended by the transition molding manufacturer. Install transition molding at edges of flooring that would otherwise be exposed, where the transition abuts another type of flooring, and as noted in the Drawings.

3.04 SHEET VINYL FLOORING INSTALLATION

- A. Unroll sheet vinyl floor coverings and allow them to stabilize before cutting and fitting. Lay out sheet vinyl flooring maintaining uniformity of floor covering direction. Minimize the number of seams keeping seams a minimum 6-inches away from parallel joints in the floor covering. Match edges of flooring for color shading at seams. Avoid cross seams.
- B. Heat-Welded Seams: Comply with ASTM F 1516. Rout joints and use welding bead to permanently fuse sections into a seamless floor covering. Prepare, weld, and finish seams to produce surfaces flush with adjoining floor covering surfaces.
- C. Integral-Flash-Cove Base: Where occurs, cove floor coverings 6-inches up vertical surfaces. Support floor coverings at horizontal and vertical junction by cove strip. Butt at top against cap strip.

3.05 RESILIENT WALL BASE INSTALLATION

- A. Apply wall base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- B. Install wall base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.
- C. Tightly adhere wall base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- D. Do not stretch wall base during installation.
- E. On masonry surfaces or other similar irregular substrates, fill voids along top edge of wall base with manufacturer's recommended adhesive filler material.
- F. Pre-molded Corners: Install pre-molded corners before installing straight pieces.

3.06 CLEANING AND PROTECTING

- A. Perform the following operations immediately after installing resilient products:
 - 1. Remove adhesive and surface blemishes using cleaner recommended by resilient product manufacturers.
 - 2. Sweep or vacuum floor thoroughly.
 - 3. Do not wash floor until after time period recommended by flooring manufacturer.
- B. Protect flooring against mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by flooring manufacturer.
 - 1. Cover products installed on floor surfaces with undyed, untreated building paper until inspection for Substantial Completion.
 - 2. Do not move heavy and sharp objects directly over floor surfaces. Place plywood or hardboard panels over flooring and under objects while they are being moved. Slide or roll objects over panels without moving panels.
- C. Clean floor surfaces not more than 4 days before dates scheduled for inspections intended to establish date of Substantial Completion in each area of Project. Clean products according to manufacturer's written recommendations.

END OF SECTION

February 27, 2026

SECTION 09680 - CARPET

PART 1 - GENERAL

1.01 SUMMARY

- A. Work Includes: Carpeting for Direct-Glue-Down Installation.
 - 1. Broadloom Pattern Looped, Tufted constructed carpet.
- B. Related Sections include the following:
 - 1. Section 09651 – RESILIENT FLOORING for resilient base.

1.02 QUALITY ASSURANCE

- A. Installer Qualifications: Carpet Installation must be preformed by Installers with a minimum of 5 years experience in the installation of commercial carpeting.
- B. Fire Test Response Characteristics: Provide products with the critical radiant flux classification indicated in Part 2, as determined by testing identical products per ASTM E 648 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.

1.03 SUBMITTALS

- A. Submit under the provisions of Section 01330 - SUBMITTAL PROCEDURES.
- B. Installation Drawings - Layout:
 - 1. Submit sets of 1/8 inch or 1/4 inch scale floor plans showing the proposed carpet layout of all areas to the Architect for approval. The drawings shall clearly indicate and accurately locate all side seams. Wherever possible, the lay of carpets in adjoining areas shall be in the same direction. Completed work shall conform to approved drawings.
 - 2. After receiving the carpeting but before cutting, submit sets of the above drawings with all proposed cross seams and piece markings added to the drawings. No cutting shall be done before the Architect approves this layout.
- C. Samples: For each carpet, color and texture, submit the following samples for Architect's approval.
 - 1. Carpet: 12-inch square.
 - 2. Exposed Edge, Transition, and other Accessory Stripping: 12-inch-long samples.
- D. Maintenance Data: For carpet to include in maintenance manuals. Include the following:
 - 1. Methods for maintaining carpet, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
 - 2. Precautions for cleaning materials and methods that could be detrimental to carpet.

1.04 PROJECT CONDITIONS

- A. All measurements and job conditions will be the responsibility of the floor covering installation contractor.
- B. Carpet installation shall be done after painting and finishing work is completed. Ceilings and overhead work shall be completed, tested and approved before carpet is installed. Close spaces to traffic during installation of the flooring.
- C. Fresh-air ventilate for 48 to 72 hours at normal room temperatures, using ventilation fans and opening windows and doors, where possible, after installation.
- D. Maintain temperature in spaces to receive flooring and accessories between 65 degrees F and 85 degrees F for at least 48 hours prior to installation, during installation, and for not less than 48 hours after installation. Install flooring after building air conditioning, dehumidifiers, etc. have operated to reduce moisture or provide approved sealer.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. General: Conform to CRI 104, "Standard for Installation of Commercial Carpet".
- B. Carpeting and pad shall be delivered to site in manufacturer's original unopened packaging with each roll having register number tags attached or registered identification stenciled on mill wrappings and intact.
- C. Materials to be stored in well ventilated spaces protected from damage, weather, dirt, stains, moisture, extreme temperatures and humidity, and other adverse conditions. Lay flat, blocked off the floor.

1.06 WARRANTY

- A. Upon completion, the carpet manufacturer shall submit a certificate warranting carpet against manufacturing defect for a period of not less than two years.
- B. Upon completion, the carpet contractor shall submit a certificate warranting the installation to be free of defects in workmanship for a period of one year to include the statement: "The carpet contractor shall, at his own expense and upon written notice from the Owner or Architect, promptly correct/replace any and all improper work and material that may become apparent within twelve months after the date of final completion".

1.07 EXTRA MATERIAL

- A. Furnish extra materials described below, before installation begins, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Carpet: Full-width rolls equal to 5 percent of amount installed for each type indicated, but not less than 10 sq. yd.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Carpet: (**CP-01**) as scheduled.
 - 1. Performance Characteristics:
 - a. Critical Radiant Flux Classification: Class 1; Not less than 0.45 W/sq. cm.
 - 2. Properties:
 - a. Fiber Content: 100% solution dyed nylon.
 - b. Primary Backing: Manufacturer's non-woven synthetic backing.
 - c. Size: As scheduled.
 - d. Pile Height: Pile height shall be as scheduled, and no more than 1/2-inch as required by ADAAG Section 302.2.
- B. Hot Melt Seaming Tape: Hot melt tape Orcon Super 3 or CT-1, AIM 750, Roberts 50-315 or 50-330 or approved equal as recommended by carpet manufacturer for taping seams and butting cut edges at backing to form secure seams and to prevent pile loss at seams.
- C. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.
- D. Adhesives:
 - 1. Carpet Adhesive (Direct-Glue-Down Installation): Water-resistant, mildew-resistant, nonstaining type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet and is recommended or provided by carpet manufacturer.
 - 2. Seam Adhesive: Latex seam sealer adhesive.
- E. Vapor Retarder (Where Required): Two-part, fluid- applied, epoxy-based membrane compatible with flooring adhesive. For field applications that are inside the weatherproofing system, vapor retarder products shall have a VOC content of not more than 100 g/L.
 - 1. Durabond D-261 Extreme Moisture Vapor Barrier Coating as manufactured by Bostik, Inc.
 - 2. Drytek Moisture Vapor Barrier as manufactured by Laticrete
 - 3. Vapor Seal – HM as manufactured by Dependable Floor Products,
 - 4. Or approved equal.

PART 3 - EXECUTION

3.01 INSPECTION OF SURFACES

- A. Before work under this section is started, the Carpet Contractor, together with the Contractor and the Inspector, shall examine all surfaces that are to receive carpet to ensure that they are in the proper condition for same. The Carpet Contractor shall notify the Contractor of unacceptable areas and/or conditions (in terms of

potential damage to the carpet) in writing. A copy of such notification shall be sent to the Architect. All such areas and/or conditions shall be corrected by the Contractor under this project prior to start of the work.

- B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710 and the following:
1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that may act as a bond breaker. Substrate surface shall be smooth and flat to within 1/8 inch per 10 feet.
 2. Slab shall be tested for moisture vapor emissions in accordance with ASTM F 1869 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Sub-floor Using Anhydrous Calcium Chloride or relative humidity in accordance with ASTM F 2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes based of the flooring and adhesive manufacturer's recommendations or requirements.
 - a. ASTM F 1869 Testing: One test shall be conducted for every 1000 square feet of flooring and the results not to exceed the value required by the floor or adhesive manufacturer per 100 square feet per 24 hours whichever is more stringent.
 - b. ASTM F 2170 Testing: Perform three (3) tests for the first 1000 square feet and at least one additional test for each additional 1000 square feet of flooring and the results shall not to exceed the value required by the floor or adhesive manufacturer whichever is more stringent.
 3. Perform alkalinity and adhesion tests recommended in writing by manufacturer.
 4. Subfloor finishes comply with requirements specified in Section 03300 - CAST-IN-PLACE CONCRETE for slabs receiving carpet flooring.
 5. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.

3.02 PREPARATION

- A. General: Comply with CRI 104, Section 8, "Substrate Preparation." and with carpet manufacturer's written installation instructions for preparing substrates indicated to receive carpet installation.
- B. Surface to receive carpet must be free of dirt, moisture and irregularities in order to present a clean, smooth surface for installation.
- C. Apply the specified vapor retarder or approved equal in strict accordance to the manufacturer's written instructions.
- D. Underlayment surface is free of irregularities and substances that may interfere with adhesive bond or show through surface.
- E. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8-inch-wide or wider and protrusions more than 1/32 inch, unless more stringent requirements are required by manufacturer's written instructions.

- F. Broom and vacuum clean substrates to be covered immediately before installing carpet.

3.03 INSTALLATION, GENERAL

- A. Every piece of carpet delivered to the job shall have been marked to indicate its proper location relative to other pieces in the installation. This information shall be written on the back of each piece in indelible ink. Also, a copy of the invoice, which shall have the manufacturer's name, pattern number(s) and color(s) shall be given to the Inspector upon delivery of the materials to the site.
- B. Carpet shall be unrolled and allowed to relax in the installation area for a minimum of 24 hours.
- C. All materials shall be installed by a licensed carpet installer.
- D. Carpet in an enclosed area shall be matched as closely as possible in color and shade. To achieve this, all the flooring laid in such an area shall be from the same dye lot whenever possible, with pieces laid adjacent to one another in the same order as fabricated. Where applicable allow for pattern repeat.
- E. Carpet shall be prepared for seaming as follows:
 - 1. Carpet edges at all seams shall be trimmed to match the carpet nap with tools and techniques best suited for the carpet style. Pile loops which are frayed in cutting shall be trimmed at the top of the primary backing. However, cutting of pile loops shall be kept to a minimum, and any seam which becomes objectionable because excessive trimming is required shall be rejected.
 - 2. A continuous bead of latex seam sealer or thermoplastic adhesive shall be applied along the base of the pile loops adjacent to all cut edges and allowed to dry thoroughly. Material must be applied in a manner that encapsulates both primary and secondary backings.
 - 3. Proper Seam Characteristics: With any seaming method, a properly constructed seam:
 - a. has cleanly trimmed edges properly secured with seam sealer;
 - b. has tightly abutted edges without gaps or overlaps;
 - c. maintains reasonable pattern match where applicable; and
 - d. will not be totally invisible.
- F. Seams and cross seams shall be made using hot melt tape. Materials and installation shall be as follows:
 - 1. Materials: 4 inches wide hot melt tape, minimum 2-1/2 inches fiberglass and/or rayon transverse reinforcing loops or strands and 9 longitudinal beaded strips of resin adhesive (Vectron 7510, Roberts 50-300 Series, Taylor #621, Orcon CT-11, Silver Triumph or approved equal.)
 - 2. Installation:
 - a. Seaming shall be done by experienced carpet layers capable of producing work in keeping with the acceptable standards in the industry.
 - b. Carpet shall be so positioned before seaming that abutting edges form a tight seam when pressed down.

- c. Tape shall be laid centered on the seam.
- d. The heating iron shall have thermostatic heat controls and shall be adjusted to a temperature which will not affect the materials in the carpet selected for this installation.
- e. The hot iron shall be drawn over the tape no faster than is necessary to ensure the complete melting of the resin adhesive (maximum 4 feet per minute). The seam shall be closed immediately behind the iron and pressed flat as needed to ensure uniform bonding and a smooth seam.

3.04 DIRECT-GLUE-DOWN INSTALLATION

- A. Install carpet in accordance to manufacturer's instructions and comply with "CRI 104", Section 13 "Direct-Glue-Down".
- B. Apply carpet adhesive to properly prepared substrate using manufacturer's recommended notch trowel. Lay carpet immediately into wet adhesive, peeling back a section periodically to make sure adhesive is penetrating into carpet backing. Carpet shall be laid in full lengths wherever possible. It shall be cut to fit snugly against all vertical surfaces and shall be installed in those cabinets, which do not have raised bottoms, as well as under movable shelving and casework. The number of seams and cross seams shall be held to a minimum. Carpet shall be aligned so that lines of carpet match as woven, length and width. Filler strips for any location shall be in one piece.
 - 1. Carpet shall be laid so that seams perpendicular to a wall do not occur at door openings in that wall unless otherwise approved by the Architect.
 - 2. Carpets in rooms or corridors less than 12 feet wide shall have no more than one seam lengthwise to the room or corridor and a minimum number of seams across the width of the room or corridor.
 - 3. Where applicable, allow for pattern repeat
- C. Once carpet is laid rolling must be performed with a roller of a weight recommended by carpet manufacturer. Roll carpet in both directions, but do not over roll.

3.05 CLEANUP

- A. Upon completion of the installation, remove all waste and excess materials, all tools and equipment, and shall carefully and thoroughly vacuum the entire floor surface.
- B. All dirt and debris shall be cleaned off, all spots shall be removed from the carpet with a proper type of spot remover, and all loose threads shall be snipped from the carpet with a sharp pair of scissors. The entire installation shall be left clean and in a condition acceptable to the Architect.

3.06 PROTECTION

Provide final protection and maintain conditions, in a manner acceptable to manufacturer and installer, to ensure carpet is not damaged or deteriorated at time of Substantial Completion.

February 27, 2026

3.07 EXCESS CARPET

All useable pieces of carpet not necessary to complete the work are to be left on the jobsite and placed in an orderly manner in such areas as designated by the Owner.

END OF SECTION

SECTION 09900 - PAINTING

PART 1 - GENERAL

1.01 SUMMARY

A. Work Includes:

1. The work includes painting and finishing of interior and exterior items and surfaces throughout the project, whether scheduled or not, except as otherwise indicated. Painting shall include new work and surfaces made bare or damaged during construction. Surface preparation, priming and coats of paint specified are in addition to shop-priming and surface treatment specified under other sections of the work and are included in this Section.
2. The work includes field painting of exposed bare and covered pipes and conduits and of hangers, exposed steel and iron work, and primed metal surfaces of equipment installed under the mechanical and electrical work, such as ducts, grilles, junction boxes, raceways, and cabinets, except as otherwise indicated.
3. "Paint" as used herein means all coating systems materials, including primers, enamels, sealers, stain, varnish, fillers, and other applied materials whether used as prime, intermediate, or finish coats, except as specifically noted herein.
4. Paint all exposed surfaces whether or not colors are designated in "schedules." Where items or surfaces are not specifically mentioned, paint these the same as adjacent similar materials or areas. If color or finish is not designated, the Architect will select these from standard colors available for the materials systems specified.

B. Painting Not Included: The following categories of work are not included as part of the field-applied finish work or are included in other sections of these specifications.

1. Shop Priming: Unless otherwise specified, shop priming of ferrous metal items is included under the various sections for miscellaneous metal, hollow metal work, and similar items, as well as fabricated components such as shop-fabricated or factory-built mechanical and electrical equipment or accessories.
2. Mechanical and Electrical Work: The prime coat for mechanical and electrical work is specified in Divisions 15 and 16, respectively. Finish coats are as specified herein.
3. Pre-Finished Items: Unless otherwise indicated, do not include painting when factory-finishing or installer finishing is specified for such items as (but not limited to) solid phenolic, plastic laminate, high performance organic coated metal, exterior finish system, finished mechanical and electrical equipment including light fixtures, switchgear, and distribution cabinets.

February 27, 2026

4. Concealed Surfaces (Present and Future): Unless otherwise indicated, painting is not required on surfaces such as walls or ceilings in concealed areas and generally inaccessible areas, furred areas, and pipe spaces.
 5. Finished Metal Surfaces: Metal surfaces of anodized aluminum, stainless steel, chromium plate, and similar finished materials will not require finish painting, unless otherwise indicated.
 6. Labels: Do not paint over any code-required labels, such as Underwriters' Laboratories, or any equipment identification, performance rating, name, or nomenclature plates.
- C. Related Sections
1. Section 07920 – SEALANTS
 2. Section 09250 – GYPSUM BOARD ASSEMBLIES
- 1.02 SUBMITTALS
- A. Submit under the provisions of Section 01330 - SUBMITTAL PROCEDURES.
- B. Schedule of Finishes: Submit sets of the proposed painting finish schedule to the Architect for approval. The schedule shall indicate the wet film thickness (mils) which the proposed paints/coatings will be applied that are necessary to achieve the final dry film thickness indicated on the Schedule of Finishes under paragraph entitled "Schedule of Finishes".
- C. Color Samples: For each type of paint system and in each color and gloss of topcoat indicated submit the following to the Architect for approval.
1. Sets of each color finish sample.
 - a. Brush-out samples on 8-1/2 x 11-inch sealed paper.
 - b. Label each coat of each Sample.
 - c. Label each Sample for location and application area.
- D. Schedule of Operations: Before work on the project is commenced, complete sets of a work schedule showing Contractor's sequence of operations and dates shall be submitted to the Architect.
1. Repainting in occupied facilities to be carried out during hours in accordance with Owner's operating requirements during silent hours. Schedule work such that painted surfaces will have dried before occupants are affected.
 2. Phasing of work shall be in accordance with the requirements of Sections 01010 - SUMMARY OF WORK.
- E. Warranty: Copies of a written warranty shall be submitted to the Architect.
- F. Certifications: Copies of asbestos-free, lead-free, zinc-chromate-free, strontium chromate-free, cadmium-free, and mercury-free paint certificates shall be submitted to the Architect.
- G. Manufacturer's Product Data Sheets: Copies of the Manufacturer's Product Data Sheets for the primers, paints, coatings, solvents, sealing and patching materials, sealants and caulking, and other materials being used shall be submitted to the

- Architect. Data sheets shall indicate thinning and mixing instructions, required film thickness (mil) and application instructions.
- H. Comprehensive Spray Plan: Where the Contractor proposes to employ airless spraying, a Comprehensive Spray Plan including the following information shall be submitted to the Architect for approval:
1. Documentation that the individual spray applicator(s) on the project have completed an approved "Spray Applicator Certification Program".
 2. The overspray protection methods proposed.
 3. The spray application instructions and recommendations of the paint manufacturer he proposes to use.
- I. Certificate of Public Liability and Property Damage Insurance.

1.03 ANALYZING AND TESTING

- A. All paints and their applied thickness shall be subject to testing whenever the Architect deems necessary to determine conformation to the requirements of these specifications. Should testing by a laboratory be required, the laboratory shall be selected by the Architect and the cost of testing shall be borne by the Contractor. However, should test results show that the paint is in compliance with these specifications, the cost will be borne by the Owner.
- B. All rejected material shall be removed from the job site immediately. Surfaces painted with the rejected material shall be redone at no additional cost to the Owner.
- C. Where the required paint thickness is deficient, the affected surface(s) shall be recoated as necessary to provide the required paint thickness at no additional cost to the Owner.

1.04 QUALITY ASSURANCE

- A. Applicator Qualifications: A firm or individual experienced in applying paints and coatings similar in material, design, and extent to those indicated for this project, whose work has resulted in applications with a record of successful in-service performance.
- B. Source Limitations: Obtain block fillers and primers for each coating system from the same manufacturer as the finish coats.

1.05 WARRANTY

- A. Warranty that the work performed under this section conforms to the contract requirements and is free of any defect in the materials used and workmanship performed by the Contractor. Such warranty shall continue for a period of Two (2) years from the Substantial Completion date and the Contractor shall remedy any such defect which is discovered during that period at no cost to the Owner.
- B. The Owner will notify the Contractor in writing within a reasonable time after discovery of any failure or defect.
- C. Should the Contractor fail to remedy any failure or defect described in Paragraph A above within 10 working days after receipt of notice thereof, Owner shall have

February 27, 2026

the right to repair or otherwise remedy such failure or defect and charge the Contractor for the cost of same.

1.06 SPECIAL REQUIREMENTS

- A. Codes: Comply with State OSHL (Occupational Safety and Health Law) and all pollution control regulations of the State Department of Health.
- B. Safety methods used during coating application shall comply with SSPC-PA Guide 3.
- C. Protection:

- 1. Persons:

- a. Take all necessary precautions to protect public pedestrians including tenants from injury.
 - b. Provide, erect, and maintain safety barricades around scaffolds, hoists, and wherever Contractor's operation creates hazardous conditions in order to properly protect the public and workmen.

- 2. Completed Work: Provide all necessary protection for wet paint surfaces.

- 3. Protective Covering: Provide and install protective covering over equipment, floor and other areas that are not scheduled for treatment. Protective covering shall be clean, sanitary drop cloth or plastic sheets. Paint applied to surfaces not scheduled for treatment shall be completely removed and surfaces shall be returned to original condition. Where paint application will be performed by use of airless spraying, ensure that protective enclosures are erected to prevent the escape of overspray from the work area.

- 4. Safeguarding of Property: Take whatever steps necessary to safeguard the work and also the property of the Owner and other individuals in the vicinity of the work area during the execution of this Contract. Contractor shall be responsible for and make good on any and all damages and for losses to work or property caused by his or his employee's negligence. Where the damaged property cannot be cleaned and restored to its original condition (i.e. prior to being damaged) it shall be replaced with a new product of equal quality. No proration or use of "used" products will be permitted.

- a. The Contractor shall be assessed \$300.00 for each incidence of property or personal damage caused by overspray until such time that a satisfactory settlement has been agreed upon by the damaged party and corrective action has been completed. All corrective action shall be settled within 24 hours from the time the damage is discovered.

Should the Contractor fail to take corrective action in a timely and expeditious manner, the Architect will contact the Contractor's Insurance company to seek resolution on the matter.

- b. The Architect will withhold payment due the Contractor until damages have been corrected or damage claims resolved. The amount of payment withheld shall be equal to a minimum of

\$2,000.00 plus the estimated cost of corrective action as determined by the Architect.

5. Fire Safety: Direct employees not to smoke in the vicinity and exercise precautions against fire at all times. Waste rags, plastic (polyester sheets), empty cans, etc., shall be removed from the site at the end of each day.
- D. Right of Rejection: The Architect will have the right to reject all work which is not in compliance with the plans and specifications. Rejected work will be redone at no additional cost to the Owner.

In addition, the Architect will have the right to require the immediate removal of any paint applicator who demonstrates negligence, lack of competence or repeated non-compliance with the contract requirements.
- E. Sequence of Operations: The sequence of operations shall divide the surfaces into work areas and present a schedule for:
 1. Surface preparation and spot prime.
 2. Prime coat.
 3. First finish coat.
 4. Second finish coat.
- F. Inspection and Approvals: Prior to commencing with the work, prepare sample panel(s) of approximately 100 square feet indicative of each phase of the work for written approval from the Architect (phases of work are: surface preparation and spot prime; prime; first finish coat; second finish coat). Give the Architect one day (24 hours minimum) advance notice of completion of sample panel(s) and provide necessary access to areas to be inspected. The Contractor is to use the approved sample as a guide for the quality of work throughout the project.
- G. Ventilation of Interior Spaces Following Painting: Following the completion of interior painting and prior to final acceptance, the interior spaces shall be ventilated and allowed to "air-out" to remove paint odors such that no odors exist at Owner's occupancy date. Where necessary and as deemed by the Architect, the Contractor shall provide fans to mechanically ventilate the space(s).

1.07 DELIVERY, STORAGE AND HANDLING

- A. Deliver paint materials to the job site in original unopened containers with original labels intact.
- B. No paint material, empty cans and paint brushes and rollers, drop cloths and rags, may be stored in buildings, but shall be stored in separate storage facilities away from the buildings. Receiving, opening, and mixing of painting materials shall be done in this area.
- C. The Contractor may furnish a job site storage facility. Such facility shall comply with requirements of the local Fire Department. The storage area shall be kept clean and facility shall be locked when not in use or when no visual supervision is possible.
- D. Ensure the safe storage and use of paint materials and the safe storage or disposal of waste, at the end of each work day.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Hazardous Material Prohibition: All paint shall be free of asbestos, lead, mercury, zinc-chromate and/or strontium chromate, and cadmium.
- B. VOC Content of Field-Applied Interior Paints and Coatings: Provide products that comply with the following limits for VOC content, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24); these requirements do not apply to paints and coatings that are applied in a fabrication or finishing shop.
 - 1. All finish paints: VOC content of 0 g/L
 - 2. Primers: VOC content of not more than 100 g/L
- C. Material shall be equal in quality to that specified under the Schedule of Finishes and any given finish shall be as labeled by one manufacturer.
- D. All materials shall be delivered to the job site in undamaged original containers bearing the manufacturer's label and shall be stored in such a manner as to prevent damage. All rejected materials shall be removed from the job site immediately.
- E. Thinning of paint shall be done using material recommended by the manufacturer. Mix proprietary products according to manufacturer's printed specifications. Compound thinner, mineral oil, kerosene, refined linseed oil, or gasoline shall not be used for thinning.
- F. Mildew and Mold Resistance:
 - 1. Mildew Treatment: All paints specified in this section shall be factory formulated to be mold and mildew resistant.
 - a. The supplier shall submit a signed certificate indicating that the primers and paints supplied for this Project are manufactured and factory formulated to be mold and mildew resistant.
 - 2. In the event a specified primer or finish paint is not formulated with mold and mildew resistant properties, provide each primer and finish paint with the maximum amount of mildewcide per gallon of paint permitted by the mildewcide manufacturer without adversely affecting the quality of the paint.
 - a. Mildewcide Additive: Zinsser Add-2 Prevent Mildew Mildewcide Additive or approved equal.
 - b. The supplier shall submit a signed certificate indicating the amounts of mildewcide added by both the paint manufacturer and the paint supplier. Mercurial fungicide shall not be used.
- G. Preparation Materials
 - 1. Cleaner: Tri Sodium Phosphate, TSP, solution.
 - 2. Sealant (JS-XX): As specified in Section 07920 – SEALANTS under "Interior Vertical and Overhead Non-Moving Joints."
 - 3. Concrete Patching material

February 27, 2026

- a. For repair of areas 1/2 inch deep or greater: SikaSet Mortar, SikaTop-122 Plus two-component polymer repair mortar, or approved equal.
- b. For repair of areas less than 1/2 inch deep: SikaTop-121 Plus two-component polymer repair mortar or approved equal.
4. Primers, undercoats, and finish coats: Employ products of the same manufacturer for all coats of a finish assembly wherever possible. Employ finish coats compatible with primers and undercoats.
5. Provide ready mix coats and undercoats. Thin, reinforce, or color only when necessary and in strict compliance with manufacturer's recommendations.

2.02 MANUFACTURERS

- A. Basis-of-Design Products: Products referenced in the Contract Document are products of Benjamin Moore. Subject to compliance with the requirements, comparable products from the following manufacturers may be incorporated into the Work:
 1. PPG
 2. Sherwin-Williams
 3. Sikkens
 4. or approved equal

2.03 SCHEDULE OF FINISHES

- A. The Schedule of Finishes is made for the convenience of the Contractor and indicates the types and quality of finishes to be applied to the surfaces. Refer to Finish Schedule for symbols indicating location for various finishes. Provide additional systems for surfaces to be painted not listed hereinafter.
- B. All paints unless otherwise noted, are the products of Benjamin Moore and are so named to establish desired quality and standard of materials. Painting materials, equal to those mentioned by trade name under the various treatments may be used, provided they meet with the approval of the Architect.
- C. Treatments shall be applied on exposed surfaces of designated materials, in conformity with instructions of the paint product used.
- D. Exterior Painting:

1. Concrete:

Prime Coat: Benjamin Moore Ultra Spec Masonry Interior/Exterior High-Build Block Filler (571).

2nd and Benjamin Moore Ultra Spec Masonry Elastomeric

3rd coats Waterproofing Coating Low Lustre (360)

2. Galvanized Metal (Steel Doors and Frames):

Cleaner***: Corotech Oil & Grease Emulsifier V600

Two coats: Corotech Acrylic DTM Enamel Semi-Gloss V331

*** Not necessary if factory primed.

February 27, 2026

3. Primed and Unprimed Ferrous and Galvanized Metal:

Primer Coat***: Corafon ADS Zinc Rich Epoxy Primer @ 3.0 mils DFT, ADS 570 Series

Intermediate Coat: Corafon ADS Epoxy Intermediate Primer @ 3.0 (1) mils DFT, ADS 573 Series

Finish (1) Coat: Corafon Urethane Mastic DTM @ 4.0 mils DFT, ADS 650 Series

*** Only recommended for steel, not required for shop-primed or galvanized steel.

4. Galvanized Sheet Metal (Mechanical Ductwork and Flashing):

Cleaner: Corotech Oil & Grease Emulsifier V600C

Prime Coat: Corotech Acrylic Metal Primer V110

2nd and 3rd V400 Corotech Polyamide Epoxy Coating Semi-gloss Coats:

E. Interior Painting:

1. Gypsum Board:

Wall:

Prime coat: Benjamin Moore Regal Premium Interior Latex Primer N216

2nd and coats: Benjamin Moore Regal Premium Interior 100% 3rd Acrylic Eggshell N319
or
Benjamin Moore Regal Premium Interior 100% Acrylic Semi-Gloss N333 (at Bathrooms)
or
Benjamin Moore Regal Premium Interior 100% Acrylic Flat N215 (at Corridors)

Prime coat: Benjamin Moore Fresh Start Multi-Purpose Latex Primer N023

2nd and 3rd coats: Benjamin Moore Eco Spec WB Interior Latex Eggshell N374
or
Benjamin Moore Eco Spec WB Interior Latex Semi-Gloss N376 (at Restrooms)

Ceiling:

Prime coat: Benjamin Moore Regal Premium Interior Latex Primer N216

2nd and coats: Benjamin Moore Regal Premium Interior 100% 3rd Acrylic Flat N215

or
Benjamin Moore Regal Premium Interior 100% Acrylic
Semi-Gloss N333 (at Bathrooms)

Prime coat: Benjamin Moore Fresh Start Multi-Purpose Latex
Primer N023

2nd and Benjamin Moore Eco Spec WB Interior Latex
3rd coats: Flat N373

or
Benjamin Moore Eco Spec WB Interior Latex Semi-
Gloss N376 (at Restrooms)

2. Transparent Wood Finish (Finish to Match Control Sample):

Filler (open Benjamin Moore Benwood Alkyd/Oil Wood Grain
grain wood): Filler 238

2 coats: Benjamin Moore Benwood Polyurethane Finish Low
Lustre C435

3. Painted Wood Finish:

Prime coat: Benjamin Moore Regal Premium Interior Latex Primer
N216

2nd and Benjamin Moore Regal Premium Interior 100% 3rd
coats: Acrylic Semi-Gloss N333

Prime coat: Benjamin Moore Fresh Start All-Purpose Alkyd Primer
N024

2nd and Benjamin Moore Eco Spec WB Interior Latex 3rd
coats: Semi-Gloss N333

4. Ferrous and Galvanized Metal:

[Cleaner***: Corotech Oil & Grease Emulsifier V600

Two Coats: Benjamin Moore UltraSpec HP DTM Acrylic Semi-
Gloss HP29.

*** Only required for galvanized metal surfaces.

5. Wall Covering Primer:

1 coat: Roman Decorating Products ECO-988 Pigmented,
Permeable Primer

PART 3 - EXECUTION

3.01 SURFACE PREPARATION

A. General:

1. Surface preparation shall be in accordance with the Painting and Decorating Contractors of America, "Architectural Specification Manual," methods are applicable to all substrates.
2. Scrub surfaces with stiff nylon bristle brush and T.S.P. solution at rate of 3/4 cup T.S.P. per gallon of warm water to remove accumulated film of wax, oil, grease, smoke, dust, dirt, chalky, or other foreign matter which would impair bond or bleeding through new finish. Thoroughly sponge wipe surfaces with clean water. Allow surfaces to thoroughly dry before priming, painting, calking, or sealing.
 - a. Following sponge wiping, the surfaces shall be allowed to dry for a minimum of 24 hours.
 - b. Wood surfaces shall have a maximum moisture content of 12 percent when measured with an electronic moisture meter.
3. Cracks and openings found at joints and where different materials abut each other shall be sealed with a caulking compound compatible with the substrate and primer/paint. The caulking shall be applied and allowed to set in accordance with the manufacturer's recommendations and instructions.

B. The painting contractor shall be wholly responsible for the finish of his work and shall not commence any part of it until surfaces are in proper condition. If painting contractor considers any surfaces unsuitable for proper finish of his work, he shall notify the Architect of this fact in writing and he shall not apply any material until the unsuitable surfaces have been made satisfactory, or until the Architect has instructed him to proceed. Major defects shall be restored by the proper trades. In general, follow paint manufacturer's directions for surface preparation for the paint to be applied.

C. Remove all hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be finish-painted or provide surface-applied protection prior to surface preparation and painting operations. Remove, if necessary, for the complete painting of the items and adjacent surfaces. Following completion of painting of each space or area, reinstall the removed items by workmen skilled in the trades involved.

D. All necessary puttying of nail holes, cracks and blemishes shall be done after priming coat has become hard and dry and before second coat is applied.

E. All surfaces adjacent to areas being finished shall be protected and left clean of paints, stains, etc. Clean drop cloths shall be used until completion of job.

F. Cementitious Materials: Prepare concrete, concrete unit masonry and cement plaster surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.

February 27, 2026

1. Use abrasive blast cleaning methods if recommended by paint manufacturer.
2. Determine alkalinity and moisture content of surfaces by performing appropriate tests. Submit test results to Architect.
 - a. Prior to painting, concrete and masonry surfaces shall be allowed to cure and dry in accordance with the paint manufacturer's instructions and recommendations.
 - b. Efflorescence and laitance shall be removed from the surface.
 - c. Prior to paint application, interior and exterior concrete and masonry (including grout joints) scheduled to receive paint shall be tested to determine the alkalinity level of the surface. Testing shall be performed in strict accordance with the test kit manufacturer's instructions. Submit test results to the Architect.
 - d. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints to be painted exceeds that permitted in manufacturer's written instructions.
 - e. Where the alkalinity level exceeds the pH level limit of the primer, take one of the following three remedies at no additional cost to the Owner:
 - 1) If new concrete or masonry, wait until alkaline level has dropped below the limit.
 - 2) Substitute a primer that is able to resist the measured alkalinity and that is compatible with the paint finish. Alkyd based primers and top-coats or epoxy ester primers shall not be used. Submit the substitute primer to the Architect for review.
 - 3) Neutralize the surface in accordance with the primer manufacturer's instructions to reduce the alkaline level. However, acid washing is not permitted where the surface has been finished with a cementitious coating.
- G. Unprimed galvanized metal shall be washed with a solution of chemical phosphoric metal etch and allowed to dry.
- H. All metal surfaces shall be made clean and free of any defects or condition that may produce unsatisfactory finish. Touch-up any chipped or abraded places on surfaces that have been shop coated with the proper primer.
- I. Gypsum Board Surfaces:
 1. Surface Cleaning: Surfaces shall be dry. Remove loose dirt and dust by brushing with a soft brush or rubbing with a dry cloth prior to application of the first coat material.
 2. Repair of Minor Defects: Prior to painting, repair joints, cracks, holes, surface irregularities, and other minor defects with patching plaster or spackling compound and sand smooth.
- J. Plywood and Wood Surfaces:

February 27, 2026

1. Surface Cleaning: Surfaces shall be free from dust and other deleterious substances and in a condition approved by the Architect prior to receiving paint or other finish. Do not use water to clean uncoated wood.
 2. Knots and Resinous Wood: Prior to application of paint, treat knots and resinous wood with an application of surface sealer.
 3. Open Joints and Other Openings: Fill with whiting putty. Sand smooth after putty has dried.
 4. Checking: Where checking of the wood is present, sand the surface, wipe, and apply a coat of pigmented orange shellac. Allow to dry before paint is applied.
- K. PVC Trims and Accessories: Paint to match adjoining surfaces unless specifically indicated to remain unpainted.

3.02 PAINT APPLICATION

A. General:

1. Apply coating materials in accordance with SSPC-PA 1. SSPC-PA 1 methods are applicable to all substrates, except as modified herein. Thoroughly work coating materials into joints, crevices, and open spaces. Touch-up damaged coatings before applying subsequent coats.
2. All work shall be done in a workmanlike manner by skilled and experienced mechanics and shall conform to the best painting practices.
3. All materials shall be applied in accordance with the manufacturer's specifications and the finished surfaces shall be free from runs, sags, drips, ridges, waves, laps, streaks, brush marks and variations in color, texture, and finish (glossy or dull). The coverage shall be complete, and each coat shall be so applied as to produce a film of uniform thickness. No paint, varnish or enamel shall be applied until the preceding coat is thoroughly dry and approved.
4. Interior areas shall be broom clean and dust free before and during the application of coating material.
5. Any mixing shall be done outside the building.

B. Application:

1. Paint application shall be by brush, roller, airless spray painting or combination thereof or as required by manufacturer.
2. Where airless spraying is provided, a nozzle of the proper size in accordance with the paint manufacturer's recommendations to properly apply the paint shall be used.
3. Spray painting method shall be used only under approved conditions. Spraying shall be done only when there is no wind, or under very low wind velocity. When wind velocity increases, all spraying operation shall be stopped. Before start of spraying, all surfaces that do not require painting shall be completely masked and protected. Adequate drop cloths shall be provided over floors, adjacent sidewalks, and over all cars parked nearby that may be stained or damaged from the spray work.

4. Drying Time: Allow time between coats, as recommended by the coating manufacturer, to permit thorough drying. Provide each coat in specified condition to receive the next coat.
 5. Primers and Intermediate Coats: Do not allow primers or intermediate coats to dry more than 30 days, or longer than recommended by the manufacturer, before applying subsequent coats. Follow manufacturer's recommendations for surface preparation if primers or intermediate coats are allowed to dry longer than recommended by manufacturers of subsequent coatings. Each coat shall cover the surface of the preceding coat or surface completely and there shall be a visually perceptible difference in shades of successive coats.
 6. Finished Surfaces: Provide finished surfaces free from runs, drops, ridges, waves, laps, brush marks, and variations in selected colors.
- C. Colors: Tint pigmented undercoats to approximately same shade as final coat. Perceptibly increase the shade of each successive coat. Colors shall be in accordance with the color schedule on the drawings or as selected by the Architect.
- D. Finish Film Thickness: Apply primer, intermediate, and finish coats to not less than 1.5 mils dry film thickness, 4 mils wet unless recommended otherwise in writing by the manufacturer, for each coat and in accordance with the manufacturer's recommendations. Verify mil thickness by use of a suitable wet film gauge. Use a Tooke or other dry film gauge to test for total dry film thickness.

3.03 MECHANICAL AND ELECTRICAL WORK

- A. Paint visible surfaces of ductwork or plenum spaces, and interior surfaces visible through grilles.
- B. Paint shop primed metal surfaces of mechanical and electrical equipment with two finish coats of paint to match adjoining wall or ceiling surfaces. Prime unprimed bare metal surfaces with specified prime coat.

3.04 MISCELLANEOUS

- A. Installation of Removed Items: After completion of final paint coat, Reinstall removed items.
- B. At the completion of other trades, touch up damaged surfaces.

3.05 CLEAN UP

- A. During the progress of the work, remove all debris, empty crates, waste, drippings, etc., and leave the grounds about the areas to be painted clean and orderly at the end of each workday.
- B. Upon completion of the work, remove staging, scaffolding, containers, and all other debris from the site. Remove all paint, shellac, oil, or stains splashed or spilled upon adjacent surfaces not requiring treatment (hardware, fixture, floor) and leave the entire job clean and acceptable.

END OF SECTION

SECTION 09905 – HIGH-PERFORMANCE WALL COATINGS

PART 1 - GENERAL

1.01 SUMMARY

A. This section includes:

1. All materials, equipment, services, and labor necessary to apply water-based textured wall coating system where indicated or scheduled.
2. Masking and protection of adjacent surfaces not scheduled to receive coating specified in the section.

B. Related Sections:

1. Section 03330 – CAST-IN-PLACE CONCRETE
2. Section 07910 – EXTERIOR WALL SEALANTS
3. Section 09900 - PAINTING

1.02 SCOPE OF WORK

A. General description

1. This work includes proper preparation of and coating of exterior vertical concrete and concrete masonry substrates that is not scheduled or indicated to receive another waterproofing membrane or paint as scheduled on the Drawings and specified in Section 09900 – PAINTING.
2. Apply primer, textured undercoat and a minimum of two coats of elastomeric topcoat.

1.03 REFERENCES

A. In addition to referenced codes and standards within this specification, the work shall comply with the latest edition of the following standards. When conflicts arise between standards, the more stringent shall apply:

1. American Society for Testing and Materials (ASTM)
 - a. ASTM D 412 - Standard Test Method for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers - Tension.
 - b. ASTM D 522 - Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings.
 - c. ASTM D 2247 - Standard Practice for Testing Water Resistance of Coatings in 100 % Relative Humidity.
 - d. ASTM D 3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
 - e. ASTM D 4541 - Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers.
 - f. ASTM D 6904 - Standard Practice for Resistance to Wind-Driven Rain for Exterior Coatings Applied on Masonry.

- g. ASTM E 96 - Standard Test Methods for Water Vapor Transmission of Materials.

1.04 SUBMITTALS

- A. Provide complete product data including all test data. Submit manufacturer's technical information including basic materials analysis and installation instructions specified material.
- B. Elastomeric Coatings Contractor shall submit a detailed description of the work to be performed, materials to be used, sequencing of work, schedule of time required for each phase of work, and special protection required during the remaining construction.
- C. Elastomeric Coatings Contractor shall submit documentation of total square footage of area to receive elastomeric coatings and quantity of materials required prior to ordering material.
- D. Submit manufacturer's standard instructions for delivery, storage, surface preparation, installation, field quality control testing and adjusting.
- E. Submit sample of written warranty for Architects review prior to commencement of work.
- F. Samples: For each color and textured scheduled or specified submit coating finish samples, 8.5 inches x 11 inches in size illustrating specified colors and textures for each selection. Step each sample in horizontal strips showing primer and overlapping second and finish coats. Show coat tinting. Identify each sample.
- G. In each different area to receive coating at the project site, apply a representative sample (approximately 100 square feet to exhibit color, texture, joint treatment, and appearance. Architect and Owner shall approve these samples prior to proceeding with work. If samples are rejected, new samples shall be installed.
- H. Final acceptance of colors will be from samples applied to the job.
- I. Field quality control adhesion test reports.
- J. Submit Material Safety Data Sheets (MSDS) for all materials and products used in conjunction with this project.

1.05 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Materials shall be applied by a contractor previously certified or approved by the material manufacturer and listed as a pre-qualified contractor.
 - a. A letter from the manufacturer's representative shall be submitted prior to application of any materials stating that the firm designated to install the specified materials is approved for the level of warranty required by this Contract.
 - 2. Work must be performed by a firm having successful experience in comparable projects and employing personnel skilled in the processes and operations indicated.

February 27, 2026

3. Elastomeric Coatings Contractor's site foreman for this work shall have a minimum of three years successful experience in comparable projects and shall have been in the employment of this firm for a minimum of one year.
- B. Manufacturer's Technical Representative
1. Manufacturer's technical representative shall inspect site prior to installation and provide the Architect with notification of acceptance of the surfaces to receive the specified products.
 2. Manufacturer's technical representative shall outline, in writing, the cleaning method and primer requirements of each substrate to be coated prior to work beginning.
 3. Manufacturer's technical representative shall inspect installation during construction and at completion of the installation and verify to the Architect that installation has been completed in accordance with the specifications and manufacturer's requirements and that work complies with warranty requirements.
 - a. Provide site visits at intervals not exceeding fourteen (14) days by manufacturer's technical representative. Provide Architect with written report including job conditions, quality of work, conformance of work with specifications and warranty requirements.
 - b. Inspections shall include cutting samples to check millage thickness of coatings.
 4. Single Source Responsibility: Provide primers and other undercoat materials produced by same manufacturer as finish coats. All materials used within the coating system, including sealants, shall be approved by coating manufacturer prior to application and used within the recommended limits.
 - a. Manufacturer of wall coating system shall be the same as used for the cement plaster systems specified in Section 09220 – CEMENT PLASTER for aesthetic consistency and compatibility.
- C. Mock-ups: The contractor shall install a mock-up of the conditioner/primer, under coat and topcoat materials to a wall area of at least 100 sq. ft. for evaluation and approval by the Architect, Owner, or Owner's representative/quality assurance agent.
- D. Field Testing: Conduct tests in accordance with ASTM D 4541 on mock-up to verify adhesion of installed primer and topcoat to prepared substrate. Test at least 3 specimens and report results to the Architect, Owner, or Owner's representative/quality assurance agent.
1. Conduct tests during coating installation as directed by the Architect, Owner, or Owner's representative/quality assurance agent to verify adhesion throughout the course of the installation.

1.06 DELIVERY AND STORAGE

- A. Deliver materials in original, new and unopened packages and containers bearing manufacturer's name and label, and following information:
1. Name or title of material.
 2. Expiration date, if applicable.

February 27, 2026

3. Manufacturer's stock number and date of manufacture.
 4. Manufacturer's name.
 5. Contents by volume, for major pigment and vehicle constituents.
 6. Thinning and mixing instructions.
 7. Application instructions.
 8. Color name and number.
 9. Batch number.
- B. Take precautions to ensure that workmen and work areas are adequately protected from fire and health hazards resulting from handling, mixing and application of special coatings.
- C. Store materials not in actual use in tightly covered containers. Maintain containers used in storage of coatings in a clean condition, free of foreign materials and residue.
- D. Protect form over heating by storage in air-conditioned storage area. Keep storage area neat and orderly. Remove oily rags and waste daily. Take all precautions required to prevent fires.

1.07 JOB CONDITIONS

- A. Do not apply coatings when the temperature of surfaces to be coated and the surrounding air temperature exceed the limits established with the material manufacturer.
- B. Do not apply coating when the ambient temperature is above 100 degrees F unless written approval from the manufacturer can be obtained.
- C. Do not apply coatings in rain, fog, or mist; or when relative humidity exceeds 85%; or to damp or wet surfaces; unless otherwise permitted by coating manufacturer's printed instructions.
- D. Do not apply to surfaces with condensation, or surface moisture.
- E. Coating work may be continued during inclement weather only if areas and surfaces to be coated are enclosed and within temperature limits established by coating manufacturer during application and curing periods.
- F. Measurements
1. It shall be Elastomeric Coatings Contractor's responsibility to obtain and verify any necessary dimensions by visiting the job site, and the Contractor shall be responsible for the correctness of same.
 2. Elastomeric Coatings Contractors shall make a physical inspection of the facilities and include all work required for the elastomeric coatings in the bid costs.

1.08 SPECIAL WARRANTY

- A. Warranty: Submit a written warranty agreeing to repair or replace elastomeric coating compounds which have failed to provide watertight surfaces for any reason, or which appear to have failed in adhesion, cohesion, abrasion-resistance,

February 27, 2026

migration-resistance, stain-resistance, general durability or any other form of apparent deterioration (excluding inherent qualities and limitations clearly specified in the manufacturer's data which was submitted).

- B. Warranty Period: Period of warranty shall be Ten (10) years, from date of Substantial Completion.
- C. Comply with these specifications for repair or replacement of work.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design Product: Textured Wall Coating System indicated in these specifications and drawings are based on StoColor Silcolastic as manufactured by Sto Corp.
- B. Subject to compliance with requirements, the following manufacturers offering equivalent products are:
 - 1. Dryvit
 - 2. Parex
 - 3. Senergy

2.02 MATERIALS

- A. Elastomeric Top Coat: Elastomeric, silicone enhanced acrylic-based, decorative and protective exterior wall coating. Weatherproof, dirt-resistant, mildew resistant, and bridges hairline cracks for use on vertical above grade concrete, stucco meeting or exceeding the following properties:
 - 1. Coating shall be vapor permeable when cured.
 - 2. Resistance to Wind Driven Rain: ASTM D 6904; Passed
 - 3. Tensile Strength: ASTM D 2370; 0.67
 - 4. Elongation: ASTM D 2370; not less than 200%
 - 5. Solids Content: Not less than 50 percent by volume.
 - 6. Mold Resistance: No Mold Growth at 90 days, ASTM D 3273
 - 7. Product: StoColor Silcolastic 80222.
- B. Accessory Materials
 - 1. Crack and Hole Fillers: Elastomeric coating manufacturer's recommended, factory-formulated crack fillers or sealants compatible with substrate and other materials.
 - 2. Primer: Elastomeric coating manufacturer's recommended, factory-formulated, alkali-resistant primer compatible with substrate and other materials indicated.
 - 3. Concrete Unit Masonry Block Filler: Factory-formulated, high-performance latex block filler compatible with substrate and other materials indicated.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates to determine if work is ready to receive elastomeric coatings. Verify that surfaces are clean, dry, and free of dust, dirt, grease, oil, curing compounds, form release agents, laitance, efflorescence, mildew, excess alkalinity, and other conditions affecting performance of work.
 - 1. Verify that new concrete and mortar to receive coating application has cured adequately in accordance with substrate and coating manufacturer's instructions.
- B. Preinstallation Testing: Prior to application of elastomeric coatings, perform the following tests to verify condition of substrate in accordance with manufacturer's instructions:
 - 1. Adhesion: Perform substrate field adhesion tests on each substrate to determine if primer is required to satisfactorily adhere elastomeric coatings to substrates.
 - 2. Alkalinity: Verify substrate is within alkalinity range acceptable to manufacturer.
 - 3. Moisture Level: Verify substrate moisture content is acceptable to manufacturer

3.02 PREPARATION

- A. Protection
 - 1. The Elastomeric Coatings Contractor shall protect all new surfaces and be responsible for correction, or payment for correction, of any damage due to his operations.
 - 2. Provide and maintain at all times any OSHA required danger signs, guards, and obstructions necessary to protect the public and workmen from any dangers inherent with or created by the work. All federal, state, and city rules and requirements pertaining to safety and all EPA standards and OSHA standards pertaining to safety shall be fulfilled as part of this Contract.
- B. Surface Preparation
 - 1. Clean surfaces
 - a. Clean building by pressure washing to remove all dust, dirt, oil, grease, loose particles, and foreign materials. Adjust pressure of spray rinse as required to clean, but not damage substrate. Allow surface to dry.
 - i) The intensity of the pressure used in power washing shall be a minimum of 2100 psi.
 - 2. Cracks 1/16-inch or smaller do not require patching by the two listed manufacturers, the contractor shall verify this when submitting manufacturer's installation procedures.
 - 3. Chip or grind out cracks larger than 1/16" to 1/8" minimum width and depth and clean surface and inside of crack with IPA and install silicone sealant into cracks and tool smooth. Silicone sealant must be from the same manufac-

turer as the elastomeric coating and must be approved by the elastomeric coating manufacturer for this purpose.

3.03 APPLICATION OF ELASTOMERIC COATING SYSTEM

- A. General: Apply special coatings by brush, roller, or spray in accordance with manufacturer's directions. Use brushes best suited for type of material being applied. Use rollers, synthetic nap as recommended by manufacturer, for material and texture required.
 - 1. Brush: nylon or synthetic bristle brushes only.
 - 2. Roller: 3/4" to 1-1/2", medium synthetic nap roller for smooth surface.
- B. Use brush application only at small inaccessible areas and limited areas such as pre-stripping of cracks.
- C. Use roller for majority of application. Completely saturate roller and keep it loaded with coating to build the required coating millage thickness. Never dry roll except for touch up. Roll the coating in a fan like pattern to achieve uniform millage.
- D. Before using, stir coating materials in accordance with manufacturer recommendations to achieve a smooth, uniform consistency.
- E. Application of primer.
 - 1. Consult manufacture technical representative prior to the start of work to verify primer requirements. Manufacture's technical representative to submit written procedure for cleaning and priming each substrate that is to receive a new coating.
 - 2. Primer shall be applied at full strength without thinner unless otherwise recommended by manufacturer and approved by Architect. When use of thinner is recommended, thin with materials as recommended by manufacturer.
 - 3. Allow primer to dry in accordance with the manufacturer's instructions.
- F. Apply additional coats of primer as required to achieve minimum two(2) mils dry film thickness in all areas.
- G. Mixing:
 - 1. Mix in accordance with published literature for the product. Mix for approximately 3 minutes using a slow-speed drill and paddle to a uniform consistency. Avoid entrapping air in the liquid during mixing.
- H. Elastomeric Top Coat Application:
 - 1. Apply 12-14 uniform wet mil coat of finish topcoat to dry under coat with brush, roller or proper spray equipment and allow to dry.
 - 2. Apply a second 12-14 uniform wet mil coat of finish top coat after first coat is completely dry.
 - 3. Minimum final dry thickness shall be 14 mils dry film thickness

3.04 FIELD QUALITY CONTROL

February 27, 2026

- A. Manufacturer shall provide a field technical representative on the jobsite to inspect material quality and application procedures. Technical Representative shall at the minimum:
 - 1. Inspect site prior to application and provide Architect with notification of acceptance of surface to receive materials.
 - 2. Inspect installation at sufficient intervals during application, not exceeding fourteen days and at completion and verify to Architect that installation is in accordance with specifications, manufacturer requirements, and warranty requirements.
- B. Architect, Consultant and Manufacturing Field Representative shall require contractor to cite sample areas on coating system to verify millage thickness and number of coats. Contractor shall repair sample cut areas.
 - 1. If millage is found to be inadequate, contractor shall be required to achieve specified millage. When additional coating is required, it shall be applied to entire wall in question, to expansion or control joints surrounding the recoated area.

3.05 ADJUSTING

- A. A final inspection shall be conducted by the Elastomeric Coatings Contractor, Manufacturer, Consultant, General Contractor and Architect.
- B. The Elastomeric Coatings Contractor shall promptly remove any work which is found unacceptable and correct any items of work listed during the final inspection.

3.06 CLEAN-UP AND PROTECTION

- A. Clean-up: During progress of work, remove from project site discarded materials, rubbish, and rags resulting from work.
- B. Upon completion of work, clean all coating-spattered surfaces. Remove spattered materials by proper methods of washing and scraping, using care not to damage finished surfaces.
- C. Protection: Protect all work against damage. Correct damage by cleaning, repairing, or replacing, and recoating as directed by Architect. Leave work in undamaged condition.
- D. Provide "Wet Paint" Signs as required to protect finished. After coating application, remove temporary protective materials installed for protection of other work during coatings operation.

END OF SECTION

DIVISION 10 - SPECIALTIES

SECTION 10212 – CUBICLE TRACKS AND CURTAINS

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes the following:
 - 1. Ceiling mounted curtain track
 - 2. Track accessories and attachments

1.02 QUALITY ASSURANCE

- A. Installer Qualifications: An installer who has completed cubicle track and curtain installation in similar material and design whose work has resulted in applications with a record of successful in-service performance.
- B. Source Limitations: Obtain cubicle track and curtain units through one source from a single manufacturer.
- C. Product Options: Drawings indicate size, profiles, and dimensional requirements of cubicle tracks and curtains and are based on the specific system indicated.
- D. Fire-Test-Response Characteristics: Provide cubicle track and curtain with surface-burning characteristics as determined by testing identical products per ASTM E 84, NFPA 255, or UL 723 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.

1.03 SUBMITTALS

- A. Submit under provisions of Section 01330 – SUBMITTAL PROCEDURES.
- B. Product Data: Include construction details, material descriptions, fire-test-response characteristics, dimensions of individual components and profiles, and finishes for each type of curtain and track assembly.
- C. Shop Drawings: Mounting details with the appropriate fasteners for specified project substrates for each track showing locations and extent. Include sections, details, and attachments to other work.
- D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below. Include Samples of accent strips to verify color selected.
 - 1. Cubicle Track: 4 inches long complete with end caps and stops.
 - 2. Curtain Fabric: 12 inches square or larger as required to demonstrate complete pattern repeat, from dye lot used for the work, with specified treatments applied.
- E. Material Certificates: For each track and curtain, signed by manufacturer.
- F. Maintenance Data: For each type of track and curtain to include in maintenance manuals.

February 27, 2026

- G. Warranty: Special warranty specified in this Section.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Store track, curtain, and accessory units in original undamaged packages and containers inside well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.
 - 1. Maintain room temperature within storage area at not less than 50 deg F during the period materials are stored.

1.05 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install track, curtain, or accessories until building is enclosed and weatherproof, wet work is complete and dry, and HVAC system is operating and maintaining temperature at 70 deg F (21 deg C) for not less than 72 hours before beginning installation and for the remainder of the construction period.
- B. Field Measurements: Verify actual locations of walls, columns, ceilings, and other construction contiguous with privacy curtain and track by field measurements before fabrication and indicate measurements on Shop Drawings.

1.06 WARRANTY

- A. Manufacturers standard warranty against manufacturer defects.

1.07 EXTRA MATERIALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
- B. Include mounting and accessory components. Replacement materials shall be from same production run as installed units.

PART 2 - PRODUCTS

2.01 CUBICLE TRACK SYSTEM

- A. Subject to compliance with the requirements listed, provide cubicle track and carriers as manufactured by CS Cubicle Curtains, 3 Werner Way, Lebanon, NJ 08833 or approved equal.
- B. Basis-of-Design Products:
 - 1. CS Cubicle Tracks: CS Cubicle Curtains #6062 suspended-mounted tracks of heavy extruded aluminum alloy 6062-T5, 1-3/8-inch x 3/4-inch, slotted to receive roller carriers, complete with accessories and components required for complete and secure installations including splices, end caps and corner bends.
 - a. Suspension Height: 3/4-inch square aluminum hangers with suspension brackets made of molded nylon to adapt to CS 6062 aluminum track.

- b. Corner Bends: Corner bends up to 36-inch radius are to be fabricated in one continuous "L" shape. Radiuses above 36-inches to be continuous or spliced based on room condition.
 - c. Finish: As Selected by Architect from manufacturers full color range.
- 2. Carriers: CS Cubicle Curtains Breakaway Carrier SBC30. Designed to pop out on one side when 8lbs of pressure is applied. Beaded Nylon Carrier.
 - a. Provide 1 carrier for each 6-inches of cubicle curtain width.
- 3. Cubicle Curtain Fabric: 100% polyester curtain with 1/2-inch diagonal mesh with opaque fabric, washable, flame retardant, and closely woven.
 - a. Type: CS Snap-Lock Curtains with plastic snaps across top fabric panels.
 - b. Pattern and Color: As indicated on the Drawings.
 - c. Width: Equal to track length from which curtain is hung plus 15%, but not less than 12-inches.
 - d. Length: Equal to floor-to-ceiling height minus 2-inches from finishes ceiling top and 12-inches above finished floor.
 - e. Mesh-Top: Type B, manufacturers standard 1/2-inch holed mesh top framed around perimeter with matching fabric as specified. Mesh height to be as indicated on the drawings.
 - f. Top Hem: Standard 1-1/2 inch wide, triple thickness, reinforced with integral web and double stitched.
 - 1) Gromets: 2 piece, rolled edge, rustproof, nickel-plated brass and spaced not more than 6-inches O.C.
 - g. Bottom and Side Hems: Not less than 1-inch wide, reinforced, triple thickness and single stitched.
 - h. Seams: Not less than 1/2-inch wide, double turned and double stitched.
 - i. Curtain Tieback: At each termination.
- C. Accessories
 - 1. Trims, Gates, Stops: Manufacturer's standard for specified sheet gauge. Color Matched Aluminum Trim.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine areas and conditions in which the cubicle track system will be installed.
 - 1. Complete all finishing operations, including painting, before beginning installation of cubicle track system materials.
 - 2. Verify that substrates and above ceiling supports are ready to receive work.
 - 3. Proceed with installation only after unsatisfactory conditions have been corrected.

February 27, 2026

3.02 INSTALLATION

- A. General: Locate the cubicle track as indicated on the approved detail drawing for the appropriate substrate.
- B. Installation of the Cubicle Track System:
 - 1. Install cubicle track, secure, secure, rigid, and true to ceiling line.
 - 2. Slide carriers onto the track.
 - 3. Install end cap or stop device.
 - 4. Secure or suspend track to ceiling system, Install with mechanical fasteners or T-grid Clips.
 - 5. Install curtains on carriers ensuring smooth operation.

3.03 CLEANING

- A. Immediately after completion of installation, remove any debris and clean surfaces in accordance with manufacturer cleaning and maintenance instructions.

END OF SECTION

February 27, 2026

SECTION 10251 - PATIENT BED SERVICE WALLS

PART 1 - GENERAL

1.01 SUMMARY

- A. Provide the work of this Section in accordance with requirements of the Contract Documents.
- B. Section includes, but is not limited to:
 - 1. Patient bed service walls (PBSW).
- C. Related Requirements:
 - 1. Division 16 sections for applicable electrical work.

1.02 ABBREVIATIONS AND ACRONYMS

- A. PBSW: Patient bed service wall.

1.03 DEFINITIONS

- A. Patient Bed Service Wall: Configurable simulated medical gas and electric service assembly or unit employing multiple service rows or columns to conveniently locate simulated medical gas, and electrical devices.
 - 1. Where indicated on Drawings as "Headwall" or " PBSW ", meaning is same as patient bed service wall.

1.04 REFERENCE STANDARDS

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency current edition.
- B. ANSI A208.1 - American National Standard for Particleboard.
- C. NECA 130 - Standard for Installing and Maintaining Wiring Devices.
- D. NEMA LD 3 - High-Pressure Decorative Laminates.
- E. NFPA 99 - Health Care Facilities Code.
- F. UL (DIR) - Online Certifications Directory Current Edition.

1.05 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate installation of units with wall framing, including stud spacing, and size, location, and installation of service utilities.
- B. Preinstallation Meeting: Conduct preinstallation meeting one week prior to start of work of this section; require attendance by all affected installers.
- C. Sequencing: Ensure that facility services connections are achieved in an orderly and expeditious manner.

February 27, 2026

1.06 ACTION SUBMITTALS

- A. Product Data: Provide descriptive literature that includes dimensions, construction, capacities, utility and service requirements, clearances, locations, required accessories, optional features, test reports, and certifications.
- B. Shop Drawings: Indicate locations in facility using large-scale plans, elevations, and cross sections.
 - 1. Include electrical ratings, overall and detailed dimensions, mounting details, rough-in and anchor placement dimensions and tolerances, installation and servicing clearances required, wiring diagrams, materials, and connection diagrams.
 - 2. Include configuration drawings showing arrangement of devices, including nurse call, simulated medical gases (compressed air), electrical receptacles, and switches.

1.07 INFORMATIONAL SUBMITTALS

- A. Certificates: Certify that products of this section meet or exceed specified requirements.
 - 1. Certify that equipment has been properly installed, adjusted, and tested in accordance with manufacturer's recommendations.

1.08 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Manuals: Include wiring diagrams, technical data sheets, and information for ordering replacement parts.
 - 1. Identify terminals on wiring diagrams to facilitate installation, maintenance, and operation.
- B. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
- C. Project Record Documents: Record actual locations of concealed facility services connections.

1.09 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with at least three years of documented experience.
- B. Installer's Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.
- C. Preconstruction Testing: Factory-test components of service walls.

1.10 MOCK-UPS

- A. Provide one mock-up of each type of PBSW specified, indicating installation interface with walls and coordination with patient bed placement.
- B. Locate where directed.
- C. Mock-up may remain as part of work.

February 27, 2026

1.11 DELIVERY, STORAGE, AND HANDLING

- A. Package each system component to ensure protection from damage during shipment and delivery. Legibly indicate on exterior of each container or crate, shipping address and brief description of contents. Outside of container, fasten waterproof envelope containing packing list and complete instructions for uncrating and handling contents.
- B. Coordinate maximum size of each shipment with opening sizes along access routes to places of storage and installation, including sizes of elevator doors and cabs.
- C. Store products clear of floor in manner to prevent damage.
- D. Protect finished surfaces during handling and installation with protective covering of polyethylene film or another suitable material.

1.12 WARRANTY

- A. Manufacturer Warranty: Provide 10-year manufacturer warranty for service wall system installation. Complete forms in Owner's name and register with manufacturer.
- B. Installer Warranty: Provide 10-year warranty for service wall system installation commencing on the Date of Substantial Completion. Complete forms in Owner's name and register with installer.
- C. The Surety shall not be held liable beyond two (2) years of the Project Acceptance Date.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Subject to compliance with requirements, available manufacturers whose products may be incorporated in the Work include, but are not limited to, the following.
 - 1. Amico Corporation.
 - 2. Hospital Systems, Inc.
 - 3. Modular Services Company.
 - 4. Or pre-approved equal

2.02 BASIS OF DESIGN

- A. Base Product: Amico Majestic Series Recessed Mounted 72" wide Double Tier Horizontal Headwall satisfying the identified requirements, characteristics, and features as specified herein.
- B. Performance Requirements:
 - 1. Manufacture items in accordance with applicable NFPA and CGA standards.

February 27, 2026

2. Design finishing assembly in accordance with CGA V-5 Standard for Diameter Index Safety System (D.I.S.S.).
3. UL listed.
4. Physical Performance:
 - a. Outlets shall have less than 3 psi [21kPa] pressure drop through the outlet at 1201/min and 50 psig [345kPa] inlet pressure.
 - b. Positive Pressure Gas Outlets: Provide primary and secondary check valves.
 - 1) Secondary check valve shall be rated for 200 psi [1379kPa], allowing primary check valve to be removed for service without isolating the entire zone.
5. Certification: After installation, provide pipeline system check in accordance with NFPA Standard 99.

2.03 PATIENT BED SERVICE WALL (PBSW) ASSEMBLIES

- A. UL (DIR) Listings: Provide assemblies, units, and components listed in following categories:
 1. Prefabricated Medical Headwalls and Medical Supply Units (KEZR).
- B. Construction: Assemblies or units consisting of structural framework, removable panels, and removable equipment console units that are factory assembled to house bedside medical services.
 1. Include provisions for gas fittings, power receptacles, and simulated nurses call patient station.
 2. VOC Limits for Adhesives: Where used in manufacture of PBSW assemblies limit VOC content to 2.1 lb/gal (250 g/ per L) or less when calculated according to 40 CFR 59, Subpart D.
- C. Gas Outlets: See applicable Division 22 sections.
 1. Gas Fittings: All gas piping shall be hard-piped to a single point of connection.
 - a. UL listed hoses for these purposes that are labeled accordingly.
 - b. Each headwall system has integrated raceways and a single area
 - c. Connection for electrical wiring for each type of power. Fascia panels, top and bottom cover panels shall be removable for access for easy installation and maintenance of headwall services
- D. Electrical Receptacles and Switches: See applicable Division 16 sections.

2.04 PBSW CONFIGURATIONS

- A. Type A1: Single bed PBSW assembly with horizontal configuration.
 1. Horizontal assemblies consisting of minimum number of rails for type of headwall indicated.
 2. Electrical Services: Wire devices in accordance with schematic diagram indicated on drawings.

February 27, 2026

2.05 PATIENT BED SERVICE WALLS FABRICATION

- A. Construct basic structural framework of 14 gauge, 0.067 inch cold-rolled steel sheet (1.72 mm cold-rolled steel sheet).
- B. Construct unit to be self-supporting for surface-mounted installation.
- C. Removable Front Panels: Construct panels of one of following materials, as standard with manufacturer for unit types specified:
 - 1. High Pressure Decorative Laminate or HPDL: NEMA LD 3, types as recommended for specific applications, complying with Grade requirements.
 - a. Substrate: Fire-retardant-treated particleboard complying with ANSI A208.1. Composed of wood chips, sawdust, or flakes of medium density, made with waterproof resin binders; of grade to suit application; sanded faces.
 - 2. Bond panel edges with aluminum extrusion designed for mounting directly to structural framework, allowing panels to be easily removed for access to internal components and for servicing of utility connections or future modifications.
 - 3. Secure panels with hidden screws or other means to offer an overall finished appearance.
 - 4. Exposed metal surfaces or trims greater than 1/8 inch (3.17 mm) wide to be of anodized aluminum, finished to resist abrasion and effects from harsh cleaning compounds.
- D. Back Panels: Attach side and back panels made of minimum 0.060 inch (1.52 mm) thick galvanized sheet steel, or equivalent strength aluminum side and back panels, with flush screws to permit close wall mounting. Finish side panels to match or compliment front panels. Match back panel for freestanding units with finish of front and side panels.
- E. Mount patient service components in consoles made up of backbox and finish fascia.
 - 1. Gas Piping: Factory-installed and manifolded for single-point connection at top of unit to facility services.
 - a. Type "L" copper pipe, cleaned, capped, protected from contact with dissimilar metals, and properly identified.
 - 2. Electrical Wiring: Factory installed.
 - 3. Patient Services: Include services indicated in "Configurations" Article, in schematic wiring diagrams on drawings, and as follows:
 - a. Receptacles: Single Hospital Grade NEMA 5-15R or 5-20R, unless otherwise specified. Identify receptacles as required by UL listing.
 - b. Gas Outlets: Compatible with those installed elsewhere in facility, factory assembled, manifolded and prepiped, with copper pipe, to single point connections of each service at top of units.

February 27, 2026

- c. Except for anodized aluminum and galvanized or stainless steel surfaces, clean and factory-paint metal surfaces with primer and not less than two coats of baked enamel.

2.06 ACCESSORIES

- A. Manufacturer's standard accessories compatible with service wall.

2.07 SOURCE QUALITY CONTROL

- A. Single Source Responsibility: Components and materials from single source.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that wall framing, facility services connections, rough-in frames, anchors and supports are accurately placed and deliver services at specified characteristics and within acceptable functional ranges.
- B. Examine areas, with installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of service walls.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Installation of patient bed service walls noted as OFCI or CFCI is by Contractor. Coordinate with items furnished and or installed by Owner.
- B. Install service wall assembly components securely, square, level, and plumb.
- C. Comply with applicable requirements of NFPA 99.
- D. Install and make facility services connections as required for complete and operational PBSW system for each unit or assembly.
 - 1. Coordinate work of affected trades.
 - 2. Electrical Components: Install and test components, wiring, and grounding in accordance with NECA 130.
 - 3. Compressed Air and System Components: Install and test components and piping system in accordance with manufacture requirements.
- E. Seal along perimeter of service wall system installation using sealant specified in Section 07270.

3.03 TOLERANCES

- A. Maximum Variation From True Position in Any Direction: 1/4 inch (6 mm).
- B. Maximum Variation From Plumb: 1/8 inch (3 mm).

February 27, 2026

3.04 SYSTEM STARTUP

- A. Prepare and start systems in accordance with manufacturers' instructions and recommendations.

3.05 ADJUSTING

- A. Adjust components for proper operation within manufacturer's published tolerances.
- B. Adjust controls and moving parts for smooth operation.

3.06 CLEANING

- A. Clean surfaces as recommended by manufacturer.

3.07 COMMISSIONING

- A. See Division 01 Section "General Commissioning Requirements" for additional commissioning requirements.
- B. Test electrical grounding for compliance with requirements of authorities having jurisdiction.
- C. Perform following Functional Tests:
 - 1. Purge and pressure-test piping connecting to service wall piping manifolds in accordance with requirements of NFPA 99.

3.08 CLOSEOUT ACTIVITIES

- A. Demonstration: Demonstrate operation of assemblies and units to Owner's personnel.
 - 1. Use operation and maintenance data as reference during demonstration.
 - 2. Briefly describe function, operation, and maintenance requirements of each component.
- B. Training: Train Owner's personnel on operation and maintenance of system.
 - 1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
 - 2. Provide minimum of two hours of training.
 - 3. Instructor: Manufacturer's training personnel.

3.09 PROTECTION

- A. Protect installed patient bed service walls from subsequent construction operations.

END OF SECTION

SECTION 10265 – IMPACT-RESISTANT WALL PROTECTION

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes the following:
 - 1. Impact-resistant wall coverings.
 - 2. Corner Guards
 - 3. Crash Rails

1.02 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer.
- B. Testing Agency Qualifications: An independent agency qualified according to ASTM E 329 for testing indicated, as documented according to ASTM E 548.
- C. Source Limitations: Obtain impact-resistant wall-protection units through one source from a single manufacturer.
- D. Product Options: Drawings indicate size, profiles, and dimensional requirements of impact-resistant wallcovering and are based on the specific system indicated.
 - 1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
- E. Fire-Test-Response Characteristics: Provide impact-resistant wallcovering with surface-burning characteristics as determined by testing identical products per ASTM E 84, NFPA 255, or UL 723 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.

1.03 SUBMITTALS

- A. Submit under provisions of Section 01330 – SUBMITTAL PROCEDURES.
- B. Product Data: Include construction details, material descriptions, impact strength, fire-test-response characteristics, dimensions of individual components and profiles, and finishes for each type of impact-resistant wallcovering.
- C. Shop Drawings: For each impact-resistant wallcovering showing locations and extent. Include sections, details, and attachments to other work.
- D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below. Include Samples of accent strips to verify color selected.
 - 1. Crash and Corner Guards: 12 inches long. Include examples of joinery, corners, end caps, top caps, and field splices.
 - 2. Impact-Resistant Wall Covering: 6 by 6 inches square

February 27, 2026

- E. Material Certificates: For each impact-resistant wallcovering, signed by manufacturer.
- F. Maintenance Data: For each impact-resistant wallcovering to include in maintenance manuals.
 - 1. Include recommended methods and frequency of maintenance for maintaining optimum condition of plastic covers under anticipated traffic and use conditions. Include precautions against using cleaning materials and methods that may be detrimental to plastic finishes and performance.
- G. Warranty: Special warranty specified in this Section.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Store impact-resistant wall-protection units in original undamaged packages and containers inside well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.
 - 1. Maintain room temperature within storage area at not less than 50 deg F during the period plastic materials are stored.
 - 2. Keep plastic sheet material out of direct sunlight.
 - 3. Store plastic wall protection components for a minimum of 72 hours, or until plastic material attains a minimum room temperature of 70 deg F.
 - a. Store impact resistant wall covering flat. Do not stand rolls or sheet on end.

1.05 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install impact-resistant wallcovering until building is enclosed and weatherproof, wet work is complete and dry, and HVAC system is operating and maintaining temperature at 70 deg F (21 deg C) for not less than 72 hours before beginning installation and for the remainder of the construction period.
- B. Field Measurements: Verify actual locations of walls, columns, and other construction contiguous with impact-resistant wallcovering by field measurements before fabrication and indicate measurements on Shop Drawings.

1.06 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of impact-resistant wallcovering that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures.
 - b. Deterioration of plastic and other materials beyond normal use.
 - 2. Warranty Period: Five years from date of Substantial Completion.

1.07 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Crash Rail and Corner-Guard Covers: Full-size plastic covers of maximum length equal to two of each type, color, and texture of units installed.
- B. Include mounting and accessory components. Replacement materials shall be from same production run as installed units

PART 2 - PRODUCTS

2.01 IMPACT-RESISTANT WALL COVERINGS

- A. Impact-Resistant Wall Covering (**WP-01**): Fabricated from plastic sheet wall-covering material having the following characteristics:
 - 1. Impact Strength: Minimum 18 ft-lbf/in. of notch when tested according to ASTM D 256, Test Method A.
 - 2. Impact Resistance: Minimum 6.5 in-lbs/mil when tested according to ASTM D 5420.
 - 3. Fire Resistance Classification: Class A when tested in accordance with ASTM E 84:
 - a. Flame-Spread Index: 25 or less.
 - b. Smoke-Developed Index: 450 or less
- B. Basis-of-Design Products:
 - 1. **WP-01**: Subject to compliance with requirements, provide P3Tec Advanced Wall Protection or approved equal.
 - a. Size: 48 inches wide.
 - b. Sheet Thickness: 0.030-inch
 - c. Color and Texture: As Scheduled
 - d. Height: Wainscot as indicated on the Drawings.
 - e. Mounting: Adhesive.
 - 2. **WP-03**: Subject to compliance with requirements, provide Koroseal Korogard, 500-series Impact Resistant Wall Coverings or approved equal.
 - a. Size: 48 inches wide.
 - b. Sheet Thickness: 0.040-inch
 - c. Color and Texture: As Scheduled
 - d. Height: As indicated on the Drawings.
 - e. Mounting: Adhesive.
- C. Accessories

February 27, 2026

1. Adhesive: Adhesive shall be solvent free with zero VOC content, low odor, no ammonia and non-flammable in wet state.
 - a. Hi-Stik Advantage adhesive.
2. Trims and Moldings: Manufacturer's standard for specified sheet gauge. Color Matched Aluminum Trim.

2.02 CORNER GUARDS

- A. Basis-of-Design Product (**CG-01**): Subject to compliance with requirements, provide Korogard Wall Protection Systems; Division of RJF International Corporation; Koroseal "Korogard Series G400 Extruded Corner Guards" or approved equal.
- B. Materials:
 1. Extruded Rigid Plastic: ASTM D 1784, Class 1, textured, chemical- and stain-resistant, high-impact-resistant acrylic-modified vinyl plastic with integral color throughout; extruded material, nominal 0.078-inch thick.
 - a. Impact Resistance: Minimum 25.4 ft-lbf/in. of notch when tested according to ASTM D 256, Test Method A.
 - b. Chemical and Stain Resistance: Tested according to ASTM D 543.
 - c. Self-extinguishing when tested according to ASTM D 635.
 - d. Flame-Spread Index: 25 or less.
 - e. Smoke-Developed Index: 450 or less.
 2. Adhesive: As recommended by impact-resistant plastic wall protection manufacturer.

2.03 CRASH RAILS

- A. Crash Rail (**WP-02**): Heavy-duty assembly consisting of continuous snap-on plastic cover installed over concealed retainer system; designed to withstand impacts.
 1. Basis-of-Design Product: Subject to compliance with requirements, provide Korogard Wall Protection Systems; a division of RJF International Corporation; C400 Series or approved equal.
 2. Cover: Extruded rigid plastic, minimum 0.078-inch wall thickness; as follows:
 - a. Profile:
 - 1) C400: 4 inch high, 7/8 inch wide, surface-mounted flush on wall.
 - b. Surface: Uniform with pebble texture finish
 - c. Color: As scheduled.
 3. Continuous Retainer: One-piece, extruded aluminum in the following thicknesses:
 - a. C400: 0.062-inches

February 27, 2026

4. Retainer Clips: Manufacturer's standard impact-absorbing clips designed for heavy-duty performance.
5. End Caps and Corners: Prefabricated, injection-molded plastic; matching color cover; field adjustable for close alignment with snap-on cover.
6. Accessories: Concealed splices and mounting hardware.
7. Mounting: Surface mounted directly to wall

2.04 CHAIR RAILS

- A. Chair Rail (as indicated on drawings): Vinyl cover with retainer.
 1. Basis-of-Design Product: Subject to compliance with requirements, provide Korogard Wall Protection Systems; a division of RJF International Corporation; CH20 Series or approved equal.
 2. Cover: Extruded rigid plastic, minimum 0.078-inch wall thickness; as follows:
 - a. Profile:
 - 1) CH20: 2-1/8 inch high, 1-1/8 inch wide, surface-mounted flush on wall.
 - b. Surface: Uniform with pebble texture finish
 - c. Color: As scheduled.
 3. Continuous Retainer: Continuous, along length of cover
 - a. CH20: 0.08-inches
 4. End Caps and Corners: Provided by manufacturer, color and texture to match chair rail cover.
 5. Accessories: Concealed splices and mounting hardware.
 6. Mounting: Surface mounted directly to wall

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates and wall areas, with Installer present, for compliance with requirements for installation tolerances, fire rating, and other conditions affecting performance of work.
 1. Ensure the wall surface is free from dirt, grease, loose paint, and scale..
 2. For impact-resistant wallcovering attached with adhesive, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 - a. Measure moisture content of surfaces using an electronic moisture meter. Apply coatings only to surfaces with moisture content equal to or less than the following:
 - 1) Plaster and gypsum board: 4%
 - 2) Masonry, cement plaster, concrete and concrete block: 4%

February 27, 2026

3. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Remove rough spots by sanding smooth walls. On concrete substrates remove high spots using a mason's stone. Sand high-gloss surfaces to ensure proper adhesion.
- B. Fill low spots on concrete wall with a trowelable Portland cement based patching compound approved by wall protection system manufacturer for applications indicated.
- C. For surfaces receiving impact resistant wallcoverings apply an acrylic primer as specified in Section 09900 – PAINTING.
- D. Complete finishing operations, including painting, before installing impact-resistant wall-protection system components.
- E. Before installation, clean substrate to remove dust, debris, and loose particles.

3.03 INSTALLATION

- A. General: Install impact-resistant wall-protection units level, plumb, and true to line without distortions in accordance with manufacturer's written instructions. Do not use materials with chips, cracks, voids, stains, or other defects that might be visible in the finished Work,
 1. Install impact-resistant wall-protection units in locations and at mounting heights indicated on Drawings.
 2. Provide splices, mounting hardware, anchors, and other accessories required for a complete installation.
 - a. Provide anchoring devices to withstand imposed loads.
 - b. Where splices occur in horizontal runs of more than 20 feet (6.1 m), splice aluminum retainers and plastic covers at different locations along the run, but no closer than 12 inches (305 mm).
 - c. Adjust end caps as required to ensure tight seams
- B. Install impact-resistance wallcovering to walls in accordance with the manufacturer's written instructions.
 1. Install impact-resistant wallcovering in locations and at mounting heights indicated on Drawings.
 2. Prior to installation, wallcovering, adhesive and accessories must be preconditioned for a minimum of 24 hours at the temperature between 65 F and 85 F.
 3. Follow adhesive manufacturer's instruction for applying adhesive.
 4. Install sheets with texture running in the same direction for uniform appearance.
 5. Install top and edge moldings, corners, and divider bars as required for a complete installation.

February 27, 2026

3.04 CLEANING

- A. Immediately after completion of installation, clean wallcovering and accessories using warm soapy water.
- B. Remove excess adhesive using methods and materials recommended in writing by manufacturer.

END OF SECTION

SECTION 10520 - FIRE EXTINGUISHERS AND CABINETS

PART 1 - GENERAL

1.01 SUMMARY

- A. Work Includes: Provide all fire extinguishers and fire extinguisher cabinets as shown on the drawings.
 - 1. Fire extinguishers.
 - 2. Fire extinguisher cabinets.

1.02 QUALITY ASSURANCE

- A. Single-Source Responsibility: Obtain extinguishers and cabinets from one source from a single manufacturer.
- B. Coordination: Verify that cabinets are sized to accommodate type and capacity of extinguishers indicated.
- C. Fire-Rated, Fire Extinguisher Cabinets: Listed and labeled to comply with requirements in ASTM E 814 for fire-resistance rating of walls where they are installed.
- D. UL-Listed Products: Fire extinguishers shall be UL listed with UL listing mark for type, rating, and classification of extinguishers.
- E. Except as indicated otherwise, conform to NFPA 10 requirements for location and type portable fire extinguishers.

1.03 SUBMITTALS

- A. Submit in accordance with Section 01330 – SUBMITTAL PROCEDURES.
 - 1. Manufacturer's Data: Submit manufacturer's descriptive literature and specifications. For fire extinguisher cabinets include rough-in dimensions, details showing mounting methods, relationships of box and trim to surrounding construction, door hardware, cabinet type and materials, trim style, door construction, panel style, and materials.
 - 2. Certificates of Compliances: Fire extinguishers shall bear the UL label. In lieu of such label, a written certificate from a Nationally recognized testing agency adequately equipped and competent to perform such services may be submitted stating that the items have been tested and that the units conform to the requirements specified herein, including methods of testing of the specified agencies.
 - 3. Samples: Submit samples of metal finishes for fire extinguisher cabinets.

1.04 DELIVERY AND STORAGE

- A. Materials delivered to the site shall be inspected for damage, unloaded and stored with a minimum of handling. The storage spaces shall be dry locations with adequate ventilation, free from dust or water, and shall permit easy access for inspection and handling.

February 27, 2026

1.05 COORDINATION

- A. Coordinate type and capacity of fire extinguishers with fire protection cabinets to ensure fit and function.

1.06 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Failure of hydrostatic test according to NFPA 10
 - b. Faulty operation of valves or release levers
 - 2. Warranty Period: Six years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 FIRE EXTINGUISHER

- A. Manufacturers: Provide fire extinguishers as manufactured by one of the following manufacturers:
 - 1. Larsen's Manufacturing Co.
 - 2. Potter-Roemer
 - 3. JL Industries, Inc.
 - 4. or Approved equal
- B. Multi-purpose, dry chemical type, UL rated, 2A:10B:C, nominal 10 lb and UL rated, 4A-80B:C, 10-pound nominal capacity, in red polyester coated steel container; Larsen Manufacturing Co. Model MP5 and Model MP10 respectively or approved equal, for Class A, B, and C fires.
 - 1. For all areas except where clean agent type are indicated for use.
- C. Clean Agent Fire Extinguishers: Provide UL rated 2A:10B:C, nominal 15 lb, clean agent extinguishers with red powder coated steel cylinder, Amerex 398 or approved equal. Provide with completed inspection tags.
 - 1. For areas where sensitive electronics or potential operating rooms are present as indicated on the drawings.
- D. Provide with standard wall bracket where indicated for surface mounting.

2.02 FIRE EXTINGUISHER CABINETS

- A. General: Provide fire extinguisher cabinets where indicated, of suitable size for housing fire extinguishers of types and capacities indicated.
- B. Construction: Manufacturer's standard enameled steel box, with trim, frame, door and hardware to suit cabinet type, trim style, and door style indicated. Weld all joints and grind smooth. Miter and weld perimeter door frames.

February 27, 2026

- C. Manufacturers: Provide fire extinguisher cabinets and brackets as manufactured by Larsen's Manufacturing Co., Potter-Roemer, JL Industries, Inc. or approved equal.
- D. Cabinet Types: Suitable for mounting conditions indicated, of the following type:
 - 1. Non- Rated Extinguisher Cabinets: Recessed, Larsen Manufacturing Co., Occult Series, Model O-2409-R
 - a. 22 gauge cold-rolled steel sheet box.
 - b. Door: Steel, Vertical Duo with clear acrylic glazing.
 - i. Provide manufacturers locking/latching device that allows emergency access to the cabinet without breaking the vision panel.
 - ii. Door and Frame Finish: White baked polyester powder coat
 - c. Box Finish: White baked polyester powder coat.
 - 2. Non- Rated Extinguisher Cabinets: Surface Mounted, Larsen Manufacturing Co., Cameo Series, Model C-2409-SM
 - a. 22 gauge cold-rolled steel sheet box.
 - b. Door: Steel frame door with clear acrylic bubble glazing.
 - i. Provide manufacturers locking/latching device that allows emergency access to the cabinet without breaking the vision panel.
 - ii. Door and Frame Finish: White baked polyester powder coat.
 - c. Box Finish: White baked polyester powder coat..

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine rough-in cabinets to verify locations prior to cabinet installation.
- B. Examine walls and partitions for thickness and framing for cabinets to verify cabinet depth and mounting prior to cabinet installation.
- C. Do not proceed until satisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Install fire extinguisher in each location noted on drawings for fire extinguisher (FE) and fire extinguisher cabinet (FEC-R) for recessed and (FEC-S) for surface mounted.
- B. Install units securely in place in accordance with manufacturer's recommended installation procedures.
- C. Install in indicated locations and mounting heights unless otherwise required to comply with applicable regulations of governing authorities. Extinguishers and cabinets in walks, halls, corridors, passageways, or aisles shall not protrude more than 4-inches in conformance with ADA Standards Section 307.2.
- D. Wipe all surfaces clean and free of soil, fingerprints, etc. after installation.

February 27, 2026

3.03 SCHEDULE

- A. Non- Rated Extinguisher Cabinets: At all locations except where bracket mounted cabinets are indicated for use.
- B. Bracket Mounted: At electric rooms, elevator machine rooms, tele-communication rooms and facility support rooms.

END OF SECTION

SECTION 10800 - TOILET ACCESSORIES

PART 1 - GENERAL

1.01 SUMMARY

- A. Work Includes: The extent of each type of toilet accessory is shown on the drawings and herein specified.
- B. Related Work Described Elsewhere:
 - 1. Section 06100 - ROUGH CARPENTRY: Blocking.

1.02 QUALITY ASSURANCE

- A. Inserts and Anchorages: Furnish inserts and anchoring devices for toilet accessories. Provide setting drawings, templates, instructions and directions for installation of anchorage devices. Coordinate delivery with other work to avoid delay.
- B. The structural strength of all grab bars, shower seats and all fasteners and mounting devices shall meet or exceed the accessibility requirements of the 2010 ADA Standards for Accessible Design Section 609.8
- C. Products:
 - 1. Provide products of the same manufacturer for each type of accessory unit and for units exposed in the same areas, wherever possible.
 - 2. Coordinate with the Architect for acceptable designs and finishes.
 - 3. Stamped names of labels on exposed faces of units will not be permitted, except where otherwise specified.
 - 4. Provide locks where specified or standard with the manufacturer. One key shall fit all locks of one brand. Provide a minimum of 6 keys.
- D. Accessibility: Mount accessories for accessible toilets in accordance with the 2010 ADA Standards for Accessible Design Sections 308.2.1, 609, 604.9.6, 603.3, 604.5, 604.9.5 where either in an accessible stall or accessible by all.
- E. Drawings may be general in nature. Accessories shown for one stall or room shall be repeated in similar stalls or rooms unless noted otherwise.

1.03 SUBMITTALS

- A. Submit in accordance with Section 01330 - SUBMITTALS.
 - 1. Manufacturer's Data: For information only, submit copies of manufacturer's specifications and installation instructions for each toilet accessory.
 - 2. Schedule: Submit a schedule listing types, quantities, and installation locations by room for each toilet accessory to be provided.
 - 3. Samples: When requested, submit full-size samples of units to Architect for review of finishes. Acceptable samples will be returned and may be used in the work. Compliance with all other requirements is the exclusive responsibility of the Contractor.

February 27, 2026

1.04 DELIVERY, STORAGE AND HANDLING

- A. Toilet accessories shall be wrapped for shipment and storage, delivered to the jobsite in manufacturer's original packaging and stored in a clean, dry area protected from construction damage and vandalism.

1.05 WARRANTY

- A. Warranty: Submit a written warranty executed by mirror manufacturer, agreeing to replace any mirrors that develop visible silver spoilage defects within warranty period.
- B. Warranty Period: 15 years from date of Substantial Completion.
- C. The warranty shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Stainless Steel: ASTM A 666 AISI, Type 304. Provide satin finish, in 0.0312-inch minimum nominal thickness, unless otherwise specified.
- B. Galvanized Steel Sheet: ASTM A 653/A 653M, G60.
- C. Fasteners: Screws, bolts and other devices of same material as accessory unit, tamper and theft resistant when exposed, and of galvanized steel when concealed.
- D. Galvanized Steel Mounting Devices: Hot-dip galvanized after fabrication ASTM A 153/A 153M.

2.02 MANUFACTURERS

- A. Product manufacturers as scheduled in the Drawings are basis-of-design manufacturers. Subject to compliance with the requirements manufacturers offering comparable products will be considered.

2.03 LIST OF TOILET ACCESSORIES

- A. As scheduled on the drawings.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Installer must examine the areas and conditions under which toilet accessories are to be installed. Notify the Contractor in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

February 27, 2026

- B. Determine that all blocking and concealed backer plates have been installed to allow mounting of accessories.

3.02 INSTALLATION

- A. Use concealed fastenings wherever possible.
- B. Provide anchors, bolts, backer plates, and other necessary fasteners, and attach accessories securely to walls and partitions in locations as shown or directed.
- C. Install concealed mounting devices and fasteners fabricated of the same material as the accessories or of galvanized steel.
- D. Install exposed mounting devices and fasteners finished to match the accessories.
- E. Provide theft-resistant stainless steel fasteners for all accessory mountings.
- F. Secure toilet room accessories to adjacent walls and partitions complying with the manufacturer's instructions for each item and each type of substrate construction.
- G. Where accessories transition uneven substrates such as between ceramic tile wainscot and wall surface above, provide finish wood spacers to completely fill all voids. Finish to match wall surface or as directed.
- H. Provide solid backing for all accessories.

3.03 CLEAN UP

- A. Clean exposed surfaces as recommended by the manufacturer and restore damaged work to its original condition or replace with new.

END OF SECTION

DIVISION 12 - FURNISHINGS

SECTION 12494 – ROLLER SHADES

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes manually operated roller shades with single rollers.

1.02 SUBMITTALS

- A. Product Data: For each type of product indicated. Include styles, material descriptions, construction details, dimensions of individual components and profiles, features, finishes, and operating instructions.
- B. Shop Drawings: Show location and extent of roller shades. Include elevations, sections, details, and dimensions not shown in Product Data. Show installation details, mountings, attachments to other work, operational clearances, and relationship to adjoining work.
- C. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:
1. Wall Framing and Window system members and attachment to building structure.
 2. Shade mounting assembly and attachment.
 3. Size and location of access to shade operator, and adjustable components.
- D. Samples for Verification:
1. Complete, full-size operating unit not less than 16 inches wide for each type of roller shade indicated.
 2. For the following products:
 - a. Shade Material: Not less than 3 inches square, with specified treatments applied. Mark face of material.
- E. Product Certificates: For each type of roller shade, signed by product manufacturer.
- F. Qualification Data: For Installer.
- G. Product Test Reports: For each type of roller shade.
- H. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for each type of roller shade.
- I. Maintenance Data: For roller shades to include in maintenance manuals. Include the following:
1. Methods for maintaining roller shades and finishes.
 2. Precautions about cleaning materials and methods that could be detrimental to fabrics, finishes, and performance.

February 27, 2026

3. Operating hardware.

1.03 QUALITY ASSURANCE

- A. Installer Qualifications: Installer shall be approved by manufacturer and shall have 5 years minimum experience of successful installations of specified products in projects of similar size and scope
- B. Source Limitations: Obtain roller shades through one source from a single manufacturer.
- C. Fire-Test-Response Characteristics: Provide roller shade band materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
 - 1. Flame-Resistance Ratings: Passes NFPA 701.
- D. Product Standard: Provide roller shades complying with WCMA A 100.1.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver shades in factory packages, marked with manufacturer and product name, fire-test-response characteristics, lead-free designation and location of installation using same designations indicated on Drawings.
- B. Store materials in a dry, secure place. Protect from weather, surface contaminants, corrosion, construction traffic and all other potential damage.

1.05 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install roller shades until construction and wet and dirty finish work in spaces, including painting, is complete and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Field Measurements: Where roller shades are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operable glazed units' operation hardware throughout the entire operating range. Notify Architect of discrepancies. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.06 EXTRA MATERIALS

- A. The manufacturer shall make available to the Owner a method of ordering new equipment for replacement or parts to be used as spares.
- B. The manufacturer shall make available new or remanufactured parts for a minimum period of ten years from the date of Substantial Completion.

PART 2 - PRODUCTS

2.01 ROLLER SHADES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide

February 27, 2026

1. Manual Single Roll Shade System (Behavioral Health Observation Rooms): Mecho/5 by MechoShade Systems, Inc; Standard Bracket with fascia.
- B. Sheer Shade (**WS-01**):
 1. Fabric Pattern: EcoSheer 6850 Series.
 2. Fabric Width: 118-inches
 3. Type and Color: 100% Polyester, PVC Free, Reversible Face shade cloth. Color as scheduled.
 4. Material Properties:
 - a. Solar Optical Properties – 1%
 - b. Bottom Hem: Straight
 5. Anti-Microbial Characteristics: Shade cloth shall conform to requirements for 'No Growth' in accordance with ASTM G 21 results for fungi, using fungus samples ATCC 9642, 9644, and 9645.
- C. Rollers: Extruded-aluminum tube of diameter and wall thickness required to support and fit internal components of operating system and the weight and width of shade band material without sagging; designed to be easily removable from support brackets; with double-sided adhesive strip for attaching shade material. Provide a minimum one turn of fabric on roller before the working section of fabric starts.
- D. Direction of Roll: Regular from back of roller.
- E. Mounting Brackets: Single mounting brackets; galvanized or zinc-plated steel
- F. Removable Bottom Flap: Extruded aluminum 0.063-inch thick; long edges rolled; continuous panel concealing bottom of shade roller, brackets, and operating hardware and operators; length as indicated on Drawings; removable design for access.
- G. Bottom Bar: Steel or extruded aluminum, with plastic or metal capped ends. Provide exposed-to-view, external type bottom bar with concealed weight bar as required for smooth, properly balanced shade operation.
- H. Mounting: Single mount between window jambs, as indicated on the Drawings, mounting permitting easy removal and replacement without damaging roller shade or adjacent surfaces and finishes.
- I. Shade Operation: Manual operator as scheduled on the Drawings:
 1. Manual Chain-and-Clutch Operating Mechanisms: With continuous-loop bead chain and clutch that stops shade movement when bead chain is released; permanently adjusted and lubricated.
 - a. Bead Chains: Stainless steel.
 - 1) Loop Length: Full length of roller shade.
 - 2) Limit Stops: Provide upper and lower ball stops.
 - 3) 100lb min breaking strength warranted from breaking for the life of the shade system

February 27, 2026

- b. Chain Tensioner: Chain Tensioning Device complying with ANSI/WCMA A100.1-2002.
- c. Lifting Force: 3.5-8.5 lbs for shade assemblies with shade band hanging weight, not including mounting hardware, of 30 lbs.

2.02 ACCESSORIES:

- A. Fascia: Removable extruded aluminum fascia, size as required to conceal shade mounting, attachable to brackets without exposed fasteners.
 - 1. Color: As Selected by Architect from manufacturer full range.
 - 2. Single Fascia: Accommodate regular roll shades.
 - 3. Profile: Square
 - 4. Configuration: Captured and Continuous as indicated on drawings.

2.03 ROLLER SHADE FABRICATION

- A. Product Description: Single roller shade consisting of a single rollers, a means of supporting the roller, a flexible sheet or band of material carried by the roller, a means of attaching the material to the roller, a bottom bar, and an operating mechanism that lifts and lowers the shade.
- B. Concealed Components: Non-corrodible or corrosion-resistant-coated materials.
 - 1. Lifting Mechanism: With permanently lubricated moving parts.
- C. Unit Sizes: Obtain units fabricated in sizes to fill window and other openings as follows, measured at 74 deg F:
- D. Installation Brackets: Designed for easy removal and reinstallation of shade, for supporting roller, and operating hardware and for hardware position and shade mounting method indicated.
- E. Installation Fasteners: No fewer than two fasteners per bracket, fabricated from metal noncorrosive to shade hardware and adjoining construction; type designed for securing to supporting substrate; and supporting shades and accessories under conditions of normal use.
- F. Color-Coated Finish: For metal components exposed to view, apply manufacturer's standard baked finish complying with manufacturer's written instructions for surface preparation including pretreatment, application, baking, and minimum dry film thickness.
- G. Colors of Metal and Plastic Components Exposed to View: [As selected by Architect from manufacturer's full range, unless otherwise indicated.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational

February 27, 2026

clearances, accurate locations of connections to building electrical system, and other conditions affecting performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 ROLLER SHADE INSTALLATION

- A. Install roller shades level, plumb, and aligned with adjacent units according to manufacturer's written instructions and located so shade band is not closer than 2 inches to interior face of glass. Allow clearances for window operation hardware.

3.03 ADJUSTING

- A. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

3.04 CLEANING AND PROTECTION

- A. Clean roller shade surfaces after installation, according to manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that roller shades are without damage or deterioration at time of Substantial Completion.
- C. Replace damaged roller shades that cannot be repaired, in a manner approved by Architect, before time of Substantial Completion.

3.05 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain roller shades.

END OF SECTION

**Project Specifications
For**

***SAMUEL MAHELONA
MEMORIAL HOSPITAL***

***Emergency Department
Renovation & Addition***

Construction Documents/Bid Set

**Kauai, Hawaii
Project No. 225057-01**

27 February 2026



SECTION 13851 - ADDRESSABLE FIRE ALARM SYSTEM

PART 1 - GENERAL

1.01 SUMMARY

- A. The work covered by this section of the Specifications shall include furnishing all labor, materials, equipment and services to construct and install the complete fire alarm system shown on the accompanying Drawings and specified herein. This work shall include but is not necessarily limited to:
1. Installation of fire alarm control panel and graphic annunciator panel.
 2. Installation of all indicating and initiating devices.
 3. Complete wiring system for devices.
 4. Test the completed system.

1.02 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. SECTION 01810 - GENERAL COMMISSIONING REQUIREMENTS
- B. SECTION 09901 - PAINTING: Painting of all conduits, raceways, ducts, cabinets, junction boxes, etc.
- C. SECTION 16100 - ELECTRICAL WORK: All power wiring including wiring to disconnect switches and breakers and wiring to all equipment.

1.03 PAYMENT PROCEDURES

- A. Permits, Tests and Inspections: Apply, secure and pay for all required permits, fees, licenses, tests, inspections and royalties necessary to accomplish the work. Schedule and coordinate required tests and inspections.

1.04 SCOPE

- A. System Description: This work includes designing and providing a new, complete, multiplex/addressable programmable fire alarm system as described herein and on the contract drawings. The system shall include all wiring, raceways, pull boxes, terminal cabinets, outlet and mounting boxes, control equipment, alarm, and supervisory signal initiating devices, alarm notification appliances, and all other accessories and miscellaneous items required for a complete operating system even though each item is not specifically mentioned or described. The system layout on the drawings is conceptual. A single fire alarm control panel is indicated with fire alarm power extender panels. Equipment, materials, installation, workmanship, inspection, and testing shall be in strict accordance with the required and advisory provisions of NFPA 72 and ADA requirement except as modified herein.

1.05 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.
1. Code of Federal Regulations (CFR)

February 27, 2026

- a. 29 CFR 1910.36 Occupational Safety and Health Standards, Subpart E - Means of Egress, General Requirements
- b. 29 CFR 1910.37 Occupational Safety and Health Standards, Subpart E, Means of Egress, General
2. American Society of Mechanical Engineers (ANSI/ASME)
 - a. ASME/ANSI A17.1 (1993) Safety Code for Elevators and Escalators
3. Factory Mutual Engineering and Research Corporation (FM)
 - a. FM P7825 (2001) Approval Guide
4. National Electrical Manufacturers Association (NEMA)
 - a. NEMA ICS 1 (1993) Industrial Control and Systems
5. National Fire Protection Association (NFPA)
 - a. NFPA 70 (2008) National Electrical Code
 - b. NFPA 72 (2010) National Fire Alarm Code
 - c. NFPA 90A (1999) Installation of Air Conditioning and Ventilating Systems
6. Underwriters Laboratories Inc. (UL)
 - a. UL 464 (1990) Audible Signal Appliances
 - b. UL 864 (1991; R 1994, Bul. 1995) Control Units for Fire- Protective Signaling Systems
 - c. UL 1449 (1985; Errata 1986, Bul. 1993, 1994, and 1995) Transient Voltage Surge Suppressors
 - d. UL FPED (2001) Fire Protection Equipment Directory
7. American Electricians Handbook by Croft (latest edition), McGraw-Hill
8. Practical Electrical Wiring by Herbert P. Richter and W. Creighton Schwan, McGraw-Hill
9. Copper Development, Inc.'s "Copper Building Wire Handbook"
10. National Electrical Safety Code
11. Local ordinances and regulations of the County of Honolulu
12. International Municipal Signal Association Inc. Specification No. 19-1 1991, polyethylene insulated, polyvinyl chloride jacket signal cable; and
13. Applicable instructions of the manufacturer for equipment and materials supplied for the project.

1.06 SUBMITTALS

- A. Submit in accordance with SECTION 01330 - SUBMITTAL PROCEDURES. Partial submittals will not be acceptable. Submit for approval six (6) complete sets of submittals as described below. Annotate descriptive data to show the specific model, type, and size of each item the Contractor proposes to furnish. Do not commence work until the design of the system and the various components have been approved. The Contracting Officer will review and

approve all submittals. Before work is commenced the shop drawings must be approved.

B. Manufacturer's Catalog Data:

1. Manual fire alarm stations
2. Smoke sensors
3. Addressable interface devices
4. Audiovisual alarms
5. Visual alarms
6. Speakers & Speaker Strobes
7. Fire alarm power extender panels

C. Shop (Working) Drawings:

1. Point-To-Point Wiring Diagrams: Drawings shall be job-specific. "Typical" or "generic" drawings are not acceptable. The diagrams shall include but not be limited to the following:
 - a. Locations of all System's Elements: Indicate all devices, junction boxes, handholes, and pass-through devices and entities where the cables and conductors can be accessed by personnel. Indicate the number of devices provided.
 - b. Also indicate the locations of all cable and conductor terminations and intermediate connections showing where they pass through without terminations/connections from and to equipment panels and/or devices.
 - c. Labeling of all Elements: All devices junction boxes, etc. shall be labeled by functional designations, locations and numbers such as building alphabet, room function and room number, and handhole number.
 - d. Fire Alarm Wiring and Color Codes: All cable and conductor color codes, the wire marking system and marker designation as specified herein shall be shown.
2. Equipment and/or Modular Systems Wiring Diagram: Wiring diagrams showing all equipment (control panel and annunciator in separate panel) modules, components and key internal cabinet wiring that should be accessed for tests and maintenance. Drawings shall include but not be limited to the following:
 - a. Equipment Modules and Components: The equipment modules and components layout (relative locations in proportion to the modules, components and cabinet/enclosure sizes) including the fire alarm control panel(s), battery cabinets, etc. The drawings shall also show the arrangement of modules, components, wiring and expansion space within the FACP cabinet.
 - b. Input and Output Circuits Labeling: Label the input and output circuits by circuit designations specified herein.
 - c. Internal- External Circuits Interface Information: Only information that

interfaces with external circuits and internal equipment wiring need be shown. All external wiring and circuits shall be shown in the riser diagram and the Contractor furnished Point-To-Point Wiring Diagrams.

- d. Changes in or deletion of the modular system wiring diagrams shall not require changes to the riser diagrams and the Contractor furnished Point-To-Point Wiring Diagrams and vice versa except for the panel deletion or change.
- e. Provide a complete description of the system sequence of operation for all initiating, notification, and control devices via a sequence of operation matrix diagram.
- f. Provide detailed drawings of the graphic annunciator.

D. Design Data:

- 1. Standby battery capacity calculations shall list the type of devices and modules, quantities, unit amperage draw for standby and alarm conditions, total amperage draw and battery amp/hour rating.
- 2. Provide detailed voltage drop calculations for all notification appliance circuits and releasing device circuits.
- 3. Provide data on each circuit to indicate that there is at least 25 percent spare capacity for notification appliances, and 25 percent spare capacity for initiating devices.
- 4. Amplifier power calculations shall list the types and quantities of speakers, circuits, loads, and equipment power consumptions. All amplifiers shall be sized for service at 75 percent of their rated capacity for future expansion as necessary.

E. Operations and Maintenance Manual: Provide five (5) bound copies of the Operations and Maintenance Manuals in three (3) hole binders with hard covers. The manuals shall be submitted to the Contracting Officer a minimum of two (2) weeks prior to the final test.

- 1. The manual may be provided in several volumes if so approved by the Contracting Officer.
- 2. All drawings shall be folded to letter size by individual sheets so they can be retained in the manual.
- 3. The manual shall contain the following:
 - a. Manufacturer's Printed Equipment/System Operations and Maintenance Manual, and Devices Brochures:
 - 1) Start-up, operating, preventative maintenance, adjustment and troubleshooting procedures, and parts list.
 - 2) System Control Diagrams.
 - 3) Internal equipment wiring diagrams.
 - b. Manufacturer's Representatives: The names, addresses and phone numbers of the fire alarm system manufacturer, the nearest manufacturer's representative, and the nearest supplier of the manufacturer's equipment and parts.

- c. Fire Alarm System Test Results: Provide completed test data sheets with the recorded measured data obtained during pre-final testing in the designated spaces and a printout of the equipment program. The test plan shall be developed in accordance with NFPA 72, Chapter 7. Submit the following information.
 - 1) Test information applicable for the project.
 - 2) Standard attendance signature sheets.
 - F. As-Built Drawings: Submit in accordance with SECTION 01330 - SUBMITTAL PROCEDURES and SECTION 01770 - PROJECT CLOSEOUT REQUIREMENTS. Drawings shall provide a detailed description of system operation during alarm, supervisory, and trouble modes and shall include a complete list of all system addresses including input/output logic. Upon completion and before final acceptance of the work, submit complete set of as-built drawings of the system for record purposes. Drawings shall include all components and circuit diagrams complete with conductor color codes and a listing of initiating devices. Submit 24 by 36 inch drawings on reproducible vellum with title block similar to full size contract drawings.
 - G. Fire Alarm System Documentation:
 - 1. List of device addresses and corresponding messages.
 - 2. Program listing.
 - 3. List of all passwords for accessing the various protection levels.
- 1.07 QUALITY ASSURANCE**
- A. Qualification of Installer: Installation shall be accomplished by an electrical contractor with a minimum of five years experience in the installation of fire alarm systems in the State of Hawaii. The services of a technician provided by the control equipment manufacturer shall be provided to supervise installation, adjustments, and tests of the system. Prior to installation, submit data for approval by the Contracting Officer showing that the Contractor has successfully installed addressable, programmable analog intelligent interior fire alarm systems of the same type as specified herein, or that the Contractor has a firm contractual agreement with a subcontractor having such required experience. Include the names and locations of at least two installations where the Contractor, or the subcontractor referred to above, has installed such systems. Indicate the type and design of each system and certify that each system has performed satisfactorily in the manner intended for a period of not less than 18 months. Submit names and phone numbers of points of contact at each site.
 - B. Qualifications of System Technician: Installation drawings, shop drawings, and "as-built" drawings shall be prepared by, or under the supervision of, a qualified technician. Qualified technician shall be an individual who is experienced with the types of work specified herein, and is currently certified by the National Institute for Certification in Engineering Technologies (NICET) as an engineering technician with minimum Level-III certification in Fire Alarm Systems program. Contractor shall submit data showing the name and certification of the technician at or prior to submittal of drawings.
 - C. Regulatory Requirements: Devices and equipment for fire alarm service shall be listed by Underwriters Laboratories, Inc. or approved by the Factory Mutual

System or listed by other nationally recognized testing laboratories.

- D. Requirements for Fire Protection Service: Equipment and material shall have been tested by Underwriters Laboratories, Inc. and listed in UL FPED or approved by Factory Mutual and listed in FM P7825. Where the terms "listed" or "approved" appear in this specification, they shall mean listed in UL FPED or FM P7825. The omission of these terms under the description of any item of equipment described shall not be construed as waiving this requirement.
- E. Standard Products: Materials and equipment shall be standard new products of a manufacturer regularly engaged in the manufacture of such products and shall essentially duplicate items that have been in satisfactory use for at least one year prior to bid opening. Select material from one manufacturer, where possible, and not a combination of manufacturers, for any particular classification of materials.
- F. Modification of References: In NFPA publications referred to herein, consider advisory provisions to be mandatory, as though the word "shall" had been substituted for "should" wherever it appears; interpret reference to "authority having jurisdiction" to mean the County Building and Fire Departments.

1.08 GUARANTY AND CERTIFICATE

- A. The Contractor shall guaranty and certify in writing all work in this section for period of two (2) years. Should any equipment or material fail due to defective equipment, material or workmanship within this period, the Contractor shall replace the item at no cost to the State.
- B. The two (2) year guaranty shall start at the end of thirty (30) consecutive days of trouble free operation after certification by the Fire Department and acceptance by the State whichever date is the latest.

1.09 MAINTENANCE

- A. During the fire alarm system's two (2) year guaranty period, the Contractor shall supply complete maintenance and testing services for the entire fire alarm system in accordance with the manufacturer's instructions and NFPA 72. The system shall be tested and serviced every six (6) months for a minimum of four (4) times during the guaranty period. Reports prepared on Contractor-furnished standardized forms similar to the form in NFPA 72 shall be submitted to Central Services Division, Department of Accounting and General Services, 729 Kakoi Street, Honolulu, Hawaii, each time a test and/or maintenance action occurs.
- B. During the two (2) year guaranty period, the Contractor shall, upon the receipt of notice from the State's representative, promptly make all repairs arising out of defective material, workmanship or equipment. The Contractor shall respond to such notices within 12 hours after receipt of the notice.

The local representative or supplier shall have direct access to replacement parts and a fire alarm repairman, either on his own staff or in a manufacturer's service center, to ensure the system can be restored to normal operation within two (2) days of system failure. All costs including air-fare, car rental, travel time, etc. shall be borne by the contractor.

It is understood that the State will undertake repairs if, following two (2) working days after receipt of such notice, the Contractor fails to make or undertake the repairs with due diligence. The expense in connection therewith shall be charged to the Contractor.

PART 2 - PRODUCTS

2.01 MANUFACTURER QUALIFICATIONS

- A. All components of each new system shall be furnished by a single manufacturer, shall be of current design and shall be in regular and recurrent production. Provide design, materials and devices for a protected premises fire alarm system, complete, conforming to NFPA 72, except as otherwise or additionally specified herein. Acceptable manufacturers:

1. Edwards Systems Technology (EST)

2.02 SYSTEM DESIGN

- A. System Operation: System shall be a complete, supervised, noncoded, addressable multiplex fire alarm system conforming to NFPA 72. The return portion of the loop shall be remote from the supply portion of the loop. The system shall operate in the alarm mode upon actuation of any alarm initiating device. The system shall remain in the alarm mode until all initiating device(s) are reset and the fire alarm control panel is manually reset and restored to normal. The system shall provide the following functions and operating features:

1. The FACP and fire alarm control units, if used, shall provide power, annunciation, supervision and control for the system.
2. Provide Class B, Style B, initiating device circuits.
3. Provide Class B, Style 4, signaling line circuits.
4. Provide Class B, Style Y, notification appliance circuits.
5. Provide electrical supervision of wiring external to control panel for mechanical equipment shutdown and magnetic door holding circuits will not be required.
6. Provide electrical supervision of the primary power (AC) supply, presence of the battery, battery voltage, and placement of system modules within the control panel, and any extender panel(s).
7. Provide an audible and visual trouble signal to activate upon a single break or open condition, or ground fault which prevents the required operation of the system. The trouble signal shall also operate upon loss of primary power (AC) supply, absence of a battery supply, low battery voltage, or removal of alarm or supervisory panel modules. Provide a trouble alarm silence feature which will silence the audible trouble signal, without affecting the visual indicator. After the system returns to normal operating conditions, the trouble signal shall again sound until the trouble is acknowledged. A smoke sensor in the process of being verified for the actual presence of smoke shall not initiate a trouble condition.
8. Provide a notification appliance silencing switch which, when activated, will cause the notification appliances to cease operating, but not affect the liquid crystal display. This switch shall be overridden upon activation of a subsequent alarm.
9. Provide alarm verification capability for smoke sensors.
10. Provide program capability via switches in a locked portion of the FACP

to bypass the automatic notification appliance circuits, air handler shutdown features. Operation of a switch shall indicate a trouble condition on the FACP display and printer output.

11. All alarm, supervisory, or trouble signals shall be automatically transmitted to other networked panels.
 12. Alarm functions shall override trouble or supervisory functions. Supervisory functions shall override trouble functions.
 13. The system shall be field programmable. All programmed information shall be stored in non-volatile memory.
 14. The system shall be capable of operating, supervising, and/or monitoring both addressable and non-addressable alarm and supervisory devices.
 15. The system shall sustain the maximum system capacity on the number of addressable devices which may be in alarm simultaneously.
 16. Where the fire alarm system is responsible for initiating an action in another emergency control device or system, such as an HVAC system, the addressable fire alarm relay shall be within 3 feet of the emergency control device.
 17. An alarm signal shall automatically initiate the following functions:
 - a. Transmission of an alarm signal to the other networked panels.
 - b. Visual indication of the device operated on the fire alarm control panel (FACP) and on the graphic annunciator. Indication on the graphic annunciator shall be by floor, zone or circuit, and type of device.
 - c. Continuous actuation of all alarm notification appliances.
 - d. Recording of the event via the system printer.
 18. A trouble condition shall automatically initiate the following functions:
 - a. Transmission of a trouble signal to the other networked panels.
 - b. Visual indication of the system trouble on the FACP and on the graphic annunciator.
 - c. Recording of the event via the system printer.
- B. Overvoltage and Surge Protection: Provide a factory approved surge suppressor at power inputs to control panels, on all signaling line circuits, and conforming to UL 1449. Suppressor shall be hybrid MOV type providing a maximum clamping voltage of 500 volts and a 150 joule minimum energy dissipation capacity.
- C. Addressable Interface Devices: The addressable monitor device shall provide an addressable input interface to the FACP for monitoring normally-open or normally-closed contact devices.
1. Addressable Monitor Modules: Addressable Monitor Module shall be provided to connect supervised conventional initiating device or zone of supervised conventional initiating devices, including but not limited to water flow and alarm pressure switches, valve tamper switches, low pressure switches, manual release stations, and heat detectors, and

other such devices. Monitor module shall mount in a 4 inch square, 2-1/8 inch deep electrical box and shall be capable of Style B supervised wiring to the initiating device. Monitor module shall provide address setting means switches and store an internal identifying code which the control panel shall use to identify the type of devices. Monitor module shall contain an integral LED that flashes each time the monitor module is polled.

2. Addressable Control Modules: Addressable Control Module shall be provided to connect supervised conventional notification device or zone of notification devices that require an external power supply, such as audio- visual alarms, to one of the (2) wire analog loop cards in a Style Z configuration. The control module shall be capable of operating as a relay (dry contact Form C), to control auxiliary functions. The module shall mount in a 4 inch square, 2-1/8 inch deep electrical box and shall be capable of Style B supervised wiring to the indicating or control device. The module shall provide address setting means switches and store an internal identifying code which the control panel shall use to identify the type of devices. Module shall contain an integral LED that flashes each time the module is polled.
3. Isolation Modules: Provide isolation modules to isolate wire-to-wire short circuits on a loop and limit the number of other modules or sensors that are incapacitated by the short circuit fault. Place isolator modules at signaling line circuit T-taps where the T-tap will contain more than 5 addressable devices, and located such that not more than 30 addressable devices are connected between isolation modules. If a wire-to-wire short occurs, the module shall automatically open the circuit. On repair of the short, the module shall automatically reconnect the isolated section of the signaling line circuit. The module shall mount in a 4 inch square, 2-1/8 inch deep electrical box. Module shall contain an integral LED that flashes each time the module is polled and illuminates steadily to indicate that a short has been detected and isolated.

D. Smoke Sensors:

1. Photoelectric Smoke Sensors: Provide addressable photoelectric smoke sensors as follows:
 - a. Provide analog photoelectric smoke sensors utilizing the photoelectric light scattering principle for operation. Smoke sensors shall be listed for use with the fire alarm control panel.
 - b. All components shall be rust and corrosion resistant. Vibration shall have no effect on the sensor's operation. Protect the sensor chamber with a fine mesh metallic screen which prevents the entrance of insects or air born materials. The screen shall not inhibit the movement of smoke particles into the chamber.
 - c. Provide twist lock bases for the sensors. The sensors shall maintain contact with their bases without the use of springs. Provide companion mounting base with fixed wiring terminals. Terminate field wiring on the fixed terminals.
 - d. Sensors shall be equipped with screw terminals for each conductor.
 - e. The sensor address shall identify the particular unit, its location

within the system, and its sensitivity setting. Sensors shall be of the low voltage type rated for use on a 24 VDC system.

- f. Sensors shall include alarm LED which flashes under normal conditions, indicating that the sensor is operational and in regular communication with the control panel. LED to be placed into steady illumination by the control panel when the sensor is in alarm. Provide an output connection for an external remote alarm LED.
 2. Duct Smoke Sensors: Sensors in ducts shall be photoelectric type and listed by UL FPED or FM P7825 for duct installation. Duct sensors shall be provided with approved duct housing, mounted exterior to the duct, and shall be provided with perforated sampling tubes extending across the width of the duct. Activation of sensors shall cause shutdown of the associated air- handling unit, annunciation at the control panel, but shall not cause sounding of the building interior alarm devices.
- E. Manual Stations: Provide addressable noncoded type with mechanical tool-less reset feature. Locate stations as indicated. Stations shall be flush-mounted. Provide each station with screw-type terminals of proper number and type to perform functions required. Break-glass-front stations and pull-lever, break- glass-rod type are not acceptable. Provide manual station guard covers equipped with tamperproof latch which may be opened for testing or resetting after the station has been operated for fire drills. Provide tamperproof shield cover for each manual station. Moving tamperproof shield cover shall be defined as one action and pulling the manual station is defined as another action for a total two actions allowed by code.
- F. Notification Appliances:
1. Speakers: Notifier-System Sensor PN SPRL or SPRL Series
 - a. All speakers/audibles shall operate on 25 VRMS or 70VRMS with field selectable output taps from 0.5 to 2.0 Watts.
 - b. Speakers/audibles in corridors and public spaces shall produce a nominal sound output of 84 dBA at 10 feet (3m).
 - c. Frequency response shall be a minimum of 400 HZ to 4000 HZ. Capable of producing 520 HZ low Frequency for hearing impaired, etc.
 2. Audible/Visual Combination Devices
 - a. Shall meet the applicable requirements of Section A listed above for audibility.
 - b. Shall meet the requirements of Section D listed below for visibility.
 - c. Visuals shall be installed at a height no less than 90 inches from the floor and no less than 6 inches below the finished ceiling when the greater of the two cannot be achieved as required per NFPA-72
 3. Programmable Electronic Sounders
 - a. Electronic sounders shall operate on 24 VDC nominal.
 - b. Electronic sounders shall be field programmable without the use of special tools, at a sound level of at least 80 dBA measured at 10 feet from the device & low frequency 520Hz sounders shall provide sound

- level at least 75 dBA measured at the pillow per NFPA 72
- c. Shall be flush or surface mounted as shown on plans.
- 4. Strobe lights, such as the Notifier-System Sensor PN SRL series, shall meet the requirements of the ADA, UL Standard 1971, be fully synchronized, and shall meet the following criteria:
 - a. The maximum pulse duration shall be 20 milliseconds.
 - b. Strobe intensity shall meet the requirements of UL 1971.
 - c. The flash rate shall meet the requirements of UL 1971.
- 5. Manual Fire Alarm Stations
 - a. Manual fire alarm stations shall be non-code, non-break glass type, equipped with key lock so that they may be tested without operating the handle.
 - b. Stations must be designed such that after an actual activation, they cannot be restored to normal except by key reset.
 - c. An operated station shall automatically condition itself so as to be visually detected, as operated, at a minimum distance of 100 feet (30.5 m) front or side.
 - d. Manual stations shall be constructed of high impact Lexan, with operating instructions provided on the cover. The word FIRE shall appear on the manual station in letters one half inch (12.7 mm) in size or larger.
 - e. Manual Fire Alarm station shall be located within 5ft of each exit door and mounted between 42-48 inches from the finish floor as required per NFPA-72 and ADA requirements.
 - f. Add additional manual fire alarm stations when the distance between stations exceeds 200ft.
- 6. Connections: Provide screw terminals for each notification appliance. Terminals shall be designed to accept the size conductors used in this project without modification.
- G. Fire Alarm Power Extender Panels: Fire alarm power extender panel shall comply with the applicable requirements of UL 864. Panel shall be modular, installed in a surface-mounted steel cabinet with hinged door and cylinder lock. The extender panel(s) shall have the necessary components and equipment required to provide a minimum of four supervised, Class B, Style Y, notification appliance circuits. Each appliance circuit shall be rated for 1.5 amperes at 24 volts DC. An alarm signal from the FACP will initiate the four notification appliance circuits to extend the alarm. Primary power for the panel shall be 3 amperes at 120 volts AC. Standby power shall be same as FACP and charger shall be housed integrally within the cabinet.
- H. System Wiring: Provide wiring materials under this section as specified in SECTION 16050 - ELECTRICAL WORK with the additions and modifications specified herein.
 - 1. Wiring within Cabinets, Enclosures, Boxes, Etc.: Provide wiring installed in a neat and workmanlike manner and installed parallel with or at right

angles to the sides and back of any box, enclosure or cabinet. All conductors which are terminated, spliced, or otherwise interrupted in any enclosure, cabinet, mounting or junction box shall be connected to terminal blocks. Mark each terminal in accordance with the wiring diagrams of the system. Make all connections with approved pressure type terminal blocks, which are securely mounted.

2. Terminal Cabinets: Provide a terminal cabinet at the base of any circuit riser. Terminal size shall be appropriate for the size of the wiring to be connected. All conductor terminations shall be labeled and a drawing containing all conductors, their labels, their circuits and their interconnection shall be permanently mounted in the terminal cabinet. Minimum size is 8 inches high by 8 inches wide.
3. Above Grade Alarm Wiring: Conductors shall be Type THHN/THWN. Type TW is not permitted. Signaling line circuits and initiating device circuit field wiring shall be twisted pair No. 18 to No. 12 AWG, depending on distance and per manufacturer's recommendations. Visual alarm signal and audible appliance circuits shall be single solid copper No. 14 AWG size conductors at a minimum. Speaker circuits shall be solid copper No. 16 AWG size conductors at a minimum. Wire size shall be sufficient to prevent voltage drop problems. Power wiring, operating at 120 VAC minimum, shall be No. 12 AWG solid copper having similar insulation. Provide wiring in electrical metallic tubing in dry locations not enclosed in concrete or where not subject to mechanical damage. Provide rigid conduit in all other locations. Conceal conduit in finished areas of new construction. The use of flexible conduit not exceeding a 6 foot length shall be permitted in initiating device circuits. The minimum conduit size shall be 3/4 inch. Shielded wiring shall be utilized where recommended by the manufacturer. For shielded wiring, the shield shall be grounded at only one point, which shall be in or adjacent to the FACP. T-taps are permitted in Style 4 circuits with interconnections occurring on terminal strips. Circuits to smoke control systems, fan shutdown systems shall terminate in terminal cabinets within 3 feet of the controllers for those systems. The completion of those circuits from the terminal cabinets to the appropriate system shall be provided under the appropriate Division.
4. Conductor Terminations: Color coding is specified under PART 3 - EXECUTION. Labeling of any circuit at terminal blocks in terminal cabinets, FACP, and remote fire alarm control units shall be provided at each conductor connection. Each conductor or cable shall have a shrink-wrap label to provide a unique and specific designation. Each terminal cabinet, FACP and remote fire alarm control unit shall contain a laminated drawing which indicates each conductor, its label, circuit and terminal. The laminated drawing shall be neat, using 12 point lettering minimum size, and mounted within each cabinet, panel or unit so that it does not interfere with the wiring or terminals. Maintain existing color code scheme where connecting to existing equipment.
5. Cable Markers:
 - a. Rectangular, commercially available polyethylene cable tags with prepunched holes at each corner for the attachment with self-locking

- ties.
- b. Minimum 0.035-inch thick.
- c. Average Tensile Strength: 4500 pounds p.s.i.
- d. Non-corrosive, non-conductive, resistant to acids, alkalis, organic solvents, salt water and distortion-resistant in temperatures up to 300 degrees F.
- d. White or yellow and machine printed with the phrase "Fire Alarm Cable - Buildings A to E" in black block letters 1/8" or larger in vertical height. Handwritten markers are not acceptable.
 - 1) The preprinting shall be permanent and shall not fade or dissolve.
 - 2) The tags shall be suitable for marking with black permanent markers. There shall also be space available for additional notes (for maintenance I service contractor use only).
- 6. Cable and Conductor Ties: One-piece, self-locking nylon ties having a minimum loop tensile strength of 175 pounds and resistance to the same conditions as cable marker.
- 7. Nameplates: Provide metallic and/or phenolic noncorrosive and non-heat sensitive nameplates for:
 - a. Fire Alarm Control Panel: The nameplates shall be factory installed, securely mounted inside the fire alarm panel with machine screws or glue, and shall also be accessible and visible. Information on the nameplates shall be 1/8" or larger lettering stamped or engraved with the following:
 - 1) Manufacturer's name and address.
 - 2) Model Number.
 - 3) Serial Number.
 - 4) Date of Manufacture.
 - 5) Manufacturer's drawing number (if available).
 - b. Subpanels and Modules: The nameplates shall be securely mounted on the Subpanels and/or module with machine screws or glue and include the following information:
 - 1) Subpanel and/or module model and/or type number.
 - 2) Catalog number.
- 8. Corrosion and Fungus Protection: Metallic equipment shall be coated with a rust-inhibiting treatment and standard finish per the manufacturer's standard. Components shall be protected against corrosion and fungus (e.g. circuit boards shall be epoxy coated).

PART 3 - EXECUTION

3.01 EXAMINATION OF THE DRAWINGS AND SPECIFICATIONS

February 27, 2026

- A. Confirm and coordinate voltages and requirements of equipment furnished by other trades which will be connected to the fire alarm system. They include detectors and dampers, and any other equipment connected to the fire alarm system. Include the above information on the field-post as-built drawings.

3.02 EXAMINATION OF SITE CONDITIONS

- A. Cabinets, panels, annunciators, outlets, pull stations, audio / visual devices and other equipment and devices shall be installed in the locations and heights shown on the drawings and/or as specified herein.
 - 1. The location of the equipment and devices shown on the plans are approximate. Before installing, the Contractor shall study adjacent construction, verify all dimensions and sizes of equipment at the job site and perform installation in what he considers the most logical manner.
 - 2. Any changes from the locations shown on the drawings must be approved by the Contracting Officer and shown on the "field-posted as-built" drawings.
 - 3. Any device may be relocated within 10'-0" before installation at the direction of Contracting Officer without additional charge to State.

3.03 INSTALLATION

- A. Protect dissimilar metals with approved fittings and treatment.
- B. Coat steel conduits installed underground with an approved asphaltic paint or plastic coating, or wrap with a shingled layer of a pressure sensitive plastic tape, half-lapped. Do not use aluminum in contact with the earth.
- C. All metallic conduits and boxes shall be grounded with a green wire ground conductor.
- D. Equipment Installation: Equipment, materials, installation, workmanship, inspection, and testing shall be in accordance with NFPA 70, NFPA 72, NEC and as modified herein.
 - 1. FACP: Locate the FACP where indicated on the drawings. Surface mount the enclosure with the bottom of the cabinet 4 feet above the finished floor. All conductor terminations shall be labeled and a drawing containing all conductors, their labels, their circuits and their interconnection shall be permanently mounted in the FACP.
 - 2. Manual Stations: Locate manual stations where shown on the drawings. Mount stations so that their operating handles are 4 feet above the finished floor.
 - 3. Notification Appliance Devices: Locate notification appliance devices where shown on the drawings. Mount assemblies on walls 80 inches above the finished floor or 6 inches below the ceiling whichever is lower.
 - 4. Smoke Sensors: Locate sensors/detectors as shown on the drawings on a 4 inch mounting box. Sensors/detectors located on the ceiling shall be installed not less than 4 inches from a side wall to the near edge. Those located on the wall shall have the top of the sensor/detector at least 4 inches below the ceiling, but not more than 12 inches below the ceiling. In the case of solid joist construction, the sensors/detectors shall be

mounted on the bottom of the joists. On smooth ceilings, sensors/detectors shall be installed not over 25 feet apart in any direction. Closer spacing shall be used when recommended by the sensor/detector manufacturer or required by NFPA 72. In raised floor spaces, the smoke sensors shall be installed to protect 225 square feet per smoke sensor with a maximum spacing of 15 feet. Install smoke sensors no closer than 3 feet from air handling supply outlets.

5. Graphic Annunciator: Locate the graphic annunciator as shown on the drawings. Flush mount the panel, with the top of the panel 6 feet above the finished floor or center the panel at 5-1/2 feet, whichever is lower.

E. Cables and Conductors:

1. Below Grade Cable Installation: Cable shall be installed as indicated on the drawings.
 - a. Conduits shall be sloped as noted on the drawings to provide drainage at handholes and manholes.
 - b. Cables shall not be installed in the same ducts, conduits, handholes, etc. with non-fire alarm circuits.
 - c. Align and clean ducts and conduits before cable installation using mandrels, and scrapers and wire brushes. Arrange with the Contracting Officer to have an inspector present for conduit and duct cleaning, and cable installation.
 - e. Properly sized tensiometer and pulling devices shall be used for cable installation. Jerking of cables during the pulling installation process shall not be allowed.
 - 1) At the request of the Contracting Officer, the Contractor shall provide proof and date of calibration of the tensiometer and cable pulling devices used.
 - 2) Cable pulling tensions shall not exceed manufacturer's recommended pulling tensions.
 - 3) Use cable lubricants and compounds that will neither change the physical characteristics nor increase the conductor insulation dielectric constants of the cable sheath.
 - f. Should the Contractor proceed with conduit cleaning and cable installation without having notified the Contracting Officer, if directed by the Contracting Officer, the Contractor shall remove the cable(s) for inspection and reinstall at no additional cost to the State.
 - 1) The Contractor may reinstall the removed cable if inspection and/or tests show no cable damage.
 - 2) If the cable is damaged, the Contractor shall install a new replacement cable at no additional cost to the State.
2. Above Grade Conductor Installation:
 - a. Conductors shall not be installed in the same conduits, ducts, junction boxes, etc. with non-fire alarm circuits. 120 volt AC fire alarm circuit conductors shall not be contained within the same multi-conductor cable nor installed with cables and other conductors

- in the same conduits, ducts, enclosures, junction boxes, etc. with 24 volt DC fire alarm circuits.
- b. Conductors shall be installed in continuous lengths. Splices shall be made in above ground junction boxes by terminating wires with wirenut connections.
- c. Cable pulling tensions shall not exceed manufacturers' recommended pulling tensions.
- d. Wire-nut connectors: Permitted for connections in above grade locations only, in junction boxes and equipment and to devices that are not available or manufactured with screw-type connections.
- 3. Conductor Color Code: Conductors shall be provided with insulation color coded as follows:
 - a. Power Branch Circuit Conductors: Red(+), White(-) for 120 VAC. Black(+), Red(-), and White (neutral) for 240 VAC.
 - b. Initiating Device Circuit: Red(+), Black(-).
 - c. Audible Notification Appliance Circuit: Blue(+), Orange(-).
 - d. Visual Notification Appliance Circuit: Brown (+), Yellow(-).
 - e. Detector Power Supply or separate annunciator wiring color code: Violet(+), Black(-).
 - f. Tie Circuit:
 - 1) Red(+), Black(-) if used as an initiating circuit.
 - 2) Blue (+), White (-) if used as a signaling circuit.
 - g. Door Holder Circuit (DHC): Pink, Pink.
 - h. Multi-conductor cable green, white, and gray colors shall not be used.
- F. Cable and Conductor Terminations and Dress: The following requirements shall apply to terminal cabinets, junction and outlet boxes larger than 12" x 12":
 - 1. Electric equipment shall be installed in a neat and workmanlike manner in accordance with NEC 373-7, Space in Enclosures.
 - 2. Cable conductors or individual conductors shall be bundled, dressed and held together with cable straps, ties or lace and fanned in a manner that equipment terminals are visible and accessible, and allow the connections to be removed and reconnected without moving a large number of wires.
 - a. Conductors to screw type connectors shall be terminated with wire lugs or with approved cable termination connectors compatible with the specific termination.
 - b. A minimum of 6 inch excess length shall be provided for conductors from the bundles to the connectors using a vibration loop as described by NEC 300-14.
 - c. Conductors shall be labeled as specified herein.
 - 3. Cross-connected conductor pairs in junction and device outlet boxes or

cabinets will not require bundling and cable straps, ties or lace but shall be neatly installed with a minimum of 6 inches of excess length so conductors can be easily traced between terminals. Label all conductors as specified herein.

4. Cabinets, junction boxes, outlet boxes, other boxes, shall have sufficient space to accommodate all conductors installed in them without crowding.
5. Completed work shall be uncrowded and uncluttered and shall allow accessibility without cutting and/or removing of any straps, ties, laces, cables, components, devices, brackets, modules, equipment and like items.
6. Cables shall be secured to junction boxes, equipment cabinet backboards, console members or to other system components using cable clamps and wraps. Provide cable support posts as required to facilitate system installation.

G. Cable and Conductor Identification System

1. Underground Cable Markers:

- a. Provide markers at both ends of the cables and at all intermediate locations where the cables are accessible and visible.
- b. Each marker shall be secured with two (2) nylon ties.

2. Conductor Markers:

- a. Provide markers at ends of each conductor connected to the control panels and terminal cabinets at each building.
- b. Attach markers a minimum of four (4) inches from the ends of conductors in a manner that will not permit accidental detachment.

3. Signaling Line Circuits: Signaling line circuits shall be labeled by zone number as shown on the drawings. Conductors shall be labeled in the fire alarm panel(s), the building's main fire alarm junction box and termination cabinet.

4. Audible and Visual Notification Circuits: Notification circuits shall be labeled by signaling circuit number as shown on the drawings. Conductors shall be labeled in the fire alarm panel(s) and in the building's fire alarm termination cabinet.

H. Framed Operating Instructions: A framed set of operating instruction printed on a white background or engraved Main Fire Alarm Panel Operating Instructions shall be provided. The framed instructions shall be permanently mounted adjacent to the main fire alarm annunciator-control panel.

I. Field Touch-up Painting: Touch-up painted surfaces and fire alarm system components damaged during installation to match the existing or specified paint and color.

J. Firestopping: Provide UL listed firestopping for all holes at conduit penetrations through floor slabs, fire rated walls, partitions with fire rated doors, corridor walls, and vertical service shafts.

3.04 TESTING

A. Testing of the New Fire Alarm System:

1. After completion of the fire alarm system's installation, turn on and leave the system on for a minimum of three (3) consecutive weeks to demonstrate that contract work operates, meets the requirements of the specifications and does not affect the operation of the entire fire alarm system.
2. Upon successful completion of the three (3) week operational period, arrange with the Contracting Officer for a pre-final fire alarm system test and inspection. The test and inspection shall demonstrate that all the Contractor installed fire alarm system equipment, devices cables and conductors are operating acceptably and have been installed in accordance with this specification.

Accordingly, the test demonstrates that the system is ready for a final test of the overall fire alarm system.

Representatives at the prefinal test shall include the Contractor, fire alarm system manufacturer's representative, user, the user's facility maintenance agency personnel, F.A. system design consultant, and the Contracting Officer. Representatives at the Final test shall include all the foregoing representatives and the County Fire Department Inspector.

3. Preliminary Test Results: Include the control panel and initiating and indicating devices, a unique identifier for each device with an indication of test results, and signature of the factory-trained technician of the control panel manufacturer and equipment installer. With reports on preliminary tests, include a hard copy of printer output information from preliminary testing, i.e. download historical file so that all test data is available for State review.

a. Tests:

- 1) Dielectric Strength and Insulation Resistance Tests: Test the dielectric strength and the insulation resistance of the system interconnecting wiring by means of an instrument capable of generating 500 volts de and equipped to indicate leakage current in 1000 megohms. For the purpose of this test, the instrument shall be connected between each conductor on the line and between each conductor and ground at the control panel end of the line, with the other extremity open circuited and all series-connected devices in place. The system shall withstand the test without breakdown and shall indicate a resistance of not less than 500,000 ohms, the measurement being taken after an electrification of not more than 1.0 minute with a de potential of not less than 100 volts nor more than 550 volts. The tests shall be witnessed by the State Inspector and test results recorded for use at the final acceptance test.
- 2) Loop Resistance Tests: Measure and record the resistance of each circuit with each pair of conductors in the circuit short-circuited at the farthest point from the circuit origin. The tests shall be witnessed by the State Inspector and test results recorded for use at the final acceptance test. Loop Resistance Tests: Measure and record the resistance of each circuit with

each pair of conductors in the circuit short-circuited at the farthest point from the circuit origin. The tests shall be witnessed by the State Inspector and test results recorded for use at the final acceptance test.

- 3) Ground Resistance Tests: Measure the resistance of each connection to ground. Ground resistance shall not exceed 5 ohms . The tests shall be witnessed by the State Inspector and test results recorded for use at the final acceptance test.
 - 4) Smoke Sensor Tests: Prior to formal inspection and tests, clean and perform sensitivity tests on each smoke sensor. Clean the smoke sensors in accordance with the manufacturer's recommended procedures. Perform voltage activation sensitivity test on each sensor and record the results. Remove sensors with a sensitivity level above or below the UL accepted sensitivity range for that sensor and replace with new sensors. Present recorded data at the formal inspection for verification. Approved copies shall become part of the operations and maintenance manual for the fire alarm system.
 - 5) Preliminary Testing: Conduct preliminary tests to ensure that all devices and circuits are functioning properly. Tests shall meet the requirements of paragraph entitled "Minimum System Tests" of this section. After preliminary testing is complete, provide a letter certifying that the installation is complete and fully operable to the State a minimum of 7 calendar days before the formal acceptance test date required in the paragraph below. Without the submission of this report, the final acceptance test is automatically canceled.
- b. Formal Acceptance Testing: Notify the State in writing when the system is ready for final acceptance testing. Submit request for test at least 15 calendar days prior to the test date. A final acceptance test will not be scheduled until the O&M Manuals are submitted and the following are provided at the job site:
- 1) Marked-up red line drawings of the system as actually installed
 - 2) Dielectric strength and insulation resistance test results
 - 3) Loop resistance test results
 - 4) Complete program printout including all input/output addresses
 - 5) A CD or DVD containing the entire software program for the system
 - 6) A list of passwords permitting access by designated State employees to all levels of the software programs(s).

The final tests shall be witnessed by the County Fire Department or the Authority Having Jurisdiction (AHJ). At this time, any and all required tests shall be repeated according to the AHJ.

Following acceptance of the system, as-built drawings and Operation and Maintenance (O&M) Manuals shall be submitted for review and acceptance.

- c. Minimum System Tests: Test the system in accordance with the procedures outlined in NFPA 72, Chapter 7. The required tests are as follows:

- 1) Verify the absence of unwanted voltages between circuit conductors and ground. The tests shall be accomplished at the preliminary test with results available at the final system test.
- 2) Verify that the control unit is in the normal condition as detailed in the manufacturer's operating and maintenance manual.
- 3) Test each initiating and indicating device and circuit for proper operation and response at the control unit.
- 4) Test the system for all specified functions in accordance with the contract drawings and specifications and the manufacturer's operating and maintenance manual.
- 5) Test both primary power and secondary power. Verify, by test, the secondary power system is capable of operating the system for the time period and in the manner specified.
- 6) Determine that the system is operable under trouble conditions as specified.
- 7) Visually inspect all wiring.
- 8) Test the battery charger and batteries.
- 9) Verify that all software control and data files have been entered or programmed into the FACP. Hard copy records and two identical diskette copies of the software and data files shall be provided to the Contracting Officer.
- 10) Verify that red-line drawings are accurate.
- 11) Measure the current in circuits to assure there is the calculated spare capacity for the circuits.
- 12) Measure voltage readings for circuits to assure that voltage drop is not excessive.
- 13) Disconnect the verification feature for smoke sensors during tests to minimize the amount of smoke or test gas needed to activate the sensor.
- 14) Measure the voltage drop at the most remote appliance on each notification appliance circuit.

4. Audio Tests:

- a. Provide test equipment and conduct audio test for the fire alarm system in and around the building and in areas where new audio alarm devices have been installed.
- b. Audio measurements shall be made in classrooms and other rooms (e.g. equipment and storage rooms) and buildings with the doors in the open and closed position.
- c. An audio test plan and proposed test equipment shall be submitted for review and approval with the test plans submittal in accordance with NFPA 72, Chapter 7.

- d. The measured data shall be recorded on data sheets provided by the Contractor and shall be part of the test plan submission and records.
 - e. At the request of the Contracting Officer, the Contractor shall provide proof of instrument calibration and date of calibration.
 - f. Contractor shall be responsible for notifying the AHJ and Fire Department of formal acceptance testing.
5. In addition to satisfactory acceptance tests of the Contractor portion of the fire alarm system, the entire fire alarm system must be accepted and certified by the County Fire Department or AHJ before commencement of the specified two-year system warranty period with full maintenance responsibility.
- The tests must demonstrate that the entire campus (or facility) fire alarm system is operating in order to receive the Fire Department Certification.
6. If requested by the Contracting Officer, isolate the contract work from the overall system and demonstrate that the contract work does not affect the operation of the overall fire alarm system and shall repeat tests at no additional cost to the State.
- B. Concealed Work: Concealed work re-opened and re-closed at random during the formal inspection as requested by the Contracting Officer shall be done at no additional cost to the State.
- C. Testing Tools and Equipment: The Contractor shall provide the tools and equipment, including handheld radios, etc. necessary to accomplish the testing.

3.05 TRAINING

- A. Conduct training and instruction for the operating and maintenance staff, as designated by the Contracting Officer, on the operation of the fire alarm panel and system.
- B. The training session shall be conducted during normal business hours, and shall last as long as necessary to properly instruct the staff, but not less than 1-hour.
- C. Instruction shall include hands-on training in routine operations and queries (reading of normal status and trouble status) of the fire alarm system.
- D. Training shall be provided for the new fire alarm system and additional circuits and devices.
- E. If the main control panel and annunciator panel are of the central processing unit (CPU) type system, instruction shall include operations and query of system status, etc.; and hands-on training in the procedures and process for operations and obtaining system status, trouble and other functional information to determine when to call for repairs and how to report the type of trouble encountered.

END OF SECTION

SECTION 15011 - GENERAL MECHANICAL PROVISIONS

PART 1 - GENERAL

1.01 SUMMARY

- A. This section applies to all sections of Division 15 - MECHANICAL. Scope of work shall be as described in the technical sections of Division 15 -MECHANICAL.

1.02 SUBMITTALS

- A. Submit required in this and other sections of Division 15 - MECHANICAL shall conform to the provisions of Section 01330 – SUBMITTAL PROCEDURES and the following additional requirements. Submittals shall include the manufacturer's name, trade name, place of manufacture, catalog model or number, nameplate data, size, layout dimension, capacity, project specification and paragraph reference, applicable industry, and technical society reference standards, years of satisfactory service, and other information necessary to establish contract compliance of each item the Contractor proposes to provide. Photographs of existing installations are unacceptable and will be returned without approval. Submittals for each section of Division 15 - MECHANICAL, shall be complete. Incomplete submittals will be returned without review.

1. Manufacturer's Catalog Data: Submittals for each manufactured item shall be current manufacturer's descriptive literature of cataloged products, equipment drawings, diagrams, performance and characteristic curves, and catalog cuts. Each submittal shall clearly identify equipment to be provided. Information not pertaining to equipment shall be deleted or crossed out.
2. Shop Drawings:
 - a. Provide at least six sets of shop drawings for each Section of Division 15 - MECHANICAL. Shop Drawings shall use a minimum scale of 1/4 inch per foot on drawing sheets the same size as contract drawings. Include floor plans, sectional views, wiring diagrams, and installation details of submitted equipment, and equipment spaces identifying and indicating proposed location, layout and arrangement of items of equipment, control panels, accessories, piping, ductwork, and other items that must be shown to ensure a coordinated installation. Wiring diagrams shall identify circuit terminals, and indicate the internal wiring for each item of equipment and the interconnection between each item of equipment. Drawings shall indicate adequate clearance for operation, maintenance, and replacement of operating equipment devices. If equipment is disapproved, drawings shall be revised to show accepted equipment and resubmitted.
 - b. The contractor shall submit the original vellum shop drawings when submitting "AS-BUILT DRAWINGS".
 - c. When shop drawings have substantial changes from the design to the point that compliance with "AS-BUILT DRAWINGS" of this Section become impractical, the approved shop drawing shall be substituted for the contract drawing and the intent of "AS BUILT DRAWINGS" paragraph implemented using the approved shop drawings.

3. **Manufacturer's Instructions:** Where installation procedures or part of installation procedures are required to be in accordance with the manufacturer's instructions, submit printed copies of those instructions with product submittals. All products or items that carry manufacturer's warranty shall be installed in accordance with manufacturer's instructions. Installation of the item shall not proceed until the manufacturer's instructions are received. Failure to submit shall be cause for rejection of the equipment or material. When manufacturer's instructions and these specifications have different requirements, the more stringent requirement shall prevail. However, if the requirements are conflicting, it is the Contractor's responsibility to notify the Engineer and Owner's representative in writing prior to procurement and installation.
 - a. All but not limited to, the following items shall be installed in accordance with the manufacturer's instructions and these bid documents.
 - 1) Air Conditioning Equipment
 - 2) Air Devices
 - 3) Duct Insulation
 - 4) Fans
 - 5) Fire Dampers
 - 6) Fire Sprinklers
 - 7) Flexible Duct
 - 8) Louvers
 - 9) Manufactured Duct Joints
 - 10) Pipe Insulation
 - 11) Pre-Insulated Piping
 - 12) Temperature Maintenance System
 - 13) Vibration Isolators
 - 14) Volume Dampers
 - 15) Water Heaters
4. **Certificates of Compliance:** Submit a certificate of compliance from the manufacturer for approval for products, finishes, and equipment as specified in the technical sections whose compliance with organizational standards or specifications is not regulated by an organization using its own listing or label as proof of compliance. The certificates shall identify the manufacturer, the products, equipment, or materials, and the referenced standard and shall simply state that the manufacturer certifies that the product conforms to the requirements specified.
5. **Reference Standards Compliance:** Where equipment for materials are specified to conform to industry and technical society reference standards of organizations such as the American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM), National Electrical Manufacturers Association (NEMA), American Society of Mechanical

Engineers (ASME), American Gas Association (AGA), American Refrigeration Institute (ARI), and Underwriters Laboratories (UL), submit proof of such conformance. If an organization uses a label or listing to indicate compliance with a particular reference standard, the label or listing will be acceptable evidence, unless otherwise specified in the individual sections.

6. Independent Testing Organization Certificate: In lieu of the label or listing, submit a certificate from an independent testing organization, competent to perform testing and approved by the Engineer and Owner's representative.
7. Operation and Maintenance Manuals: When specified in subsequent Sections of Division 15 - MECHANICAL, the Contractor shall submit six complete sets of operating and maintenance manual on all equipment and the system as a whole. Each set shall be permanently bound with table of contents and shall have a hard cover. One complete set shall be furnished at the time the test procedure is submitted, and the remaining sets shall be furnished before the contract is completed. The following identification shall be inscribed on the covers: the words "OPERATING AND MAINTENANCE MANUALS," the project name, location of the building, name of the Contractor, telephone number, and date. Flysheet shall be provided for piece of equipment and each subject. The instruction sheets shall be approximately 8-1/2 by 11 inches, with large sheets of drawings folded in. The instructions shall include, but shall not be limited to the following:
 - a. Identify each equipment with tag number, manufacturer's name, model, serial number, capacity, location, and area or rooms served.
 - b. Manufacturer's Data
 - 1) Approved equipment submittal.
 - 2) Manufacturer's wiring and control diagrams, with data to explain the detailed operation and control of each component.
 - 3) Manufacturer's operating and maintenance manuals for each piece of equipment, including lubrication instructions.
 - 4) Parts lists and recommended spare parts.
 - 5) Manufacturer's bulletins, cuts and descriptive data. Applicable data shall be indicated by highlight, arrows, or underlining. Non-applicable data shall be crossed-out.
 - c. System layout showing piping, valves, and controls.
 - d. Source of service and replacement parts.
 - e. A control sequence describing startup, operation, shutdown, restarting after power failure.
8. Operating Instructions: Submit text of posted operating instructions for each system and principal item of equipment as specified in the technical sections.
9. As-Built Drawings:
 - a. The Contractor shall maintain at the job site one (1) set of full size contract drawings, marking them in red to show all variations between

the construction actually provided and that indicated or specified in the contract documents, including buried or concealed construction.

- b. Where a choice of material or method is permitted herein or where variations in scope or character of work from that of the original contract is authorized, the drawings shall be marked to define the construction actually provided.
 - c. Where equipment installation is involved, the size, manufacturer's name, model number, power input or characteristic as applicable shall be shown on the as-built drawings.
 - d. The representation of such changes shall conform to standard drafting practice and shall include such supplementary notes, legends, and details as necessary to clearly portray the as-built construction.
 - e. The drawings shall be maintained and updated on a daily basis. The Contractor shall sign, and date each sheet to certify that the dimensions and details shown on the drawings reflect the dimensions and details, and specifications as constructed in the field.
 - f. The drawings shall show existing conditions and new work shown on the design drawings. Except that the new work shown shall be the as-built condition. Drawings shall include the equipment schedules with the installed equipment data.
 - g. Submit the following to the Engineer for review and approval:
 - 1) Job site marked-up drawings.
 - 2) Incorporate into electronic drawing files all construction variations and information required by subparagraph a through e above, and submit final as-built drawings plotted with ink on 16- pound vellum.
 - 3) Electronic files of as-built drawings in AutoCAD 2000 or later DWG format on compact disc. Electronic files shall be vector graphics, scanned raster images are not acceptable.
10. Welders Qualifications: All welders shall be certified, by an independent testing laboratory and certificates shall be submitted to the Engineer for approval. Testing of welders shall be in accordance with the welding section of ANSI B-31.09 "Building Services Piping".

1.03 QUALITY ASSURANCE

- A. Material and Equipment Qualifications: Provide materials and equipment that are standard products of manufacturers regularly engaged in the manufacture of such products, which are of a similar material, design and workmanship. Standard products shall have been in satisfactory commercial or industrial use for two-years prior to bid opening. The two-year use shall include applications of equipment and materials under similar circumstances and of similar size. The product shall have been for sale on the commercial market through advertisements, manufacturer's catalogs, or brochures during the two-year period.
- B. Alternative Qualifications: Products having less than a two-year field service record will be acceptable if a certified record of satisfactory field operation for not

less than 6000 hours, exclusive of the manufacturer's factory or laboratory tests, can be shown.

- C. Manufacturer's Nameplate: Each item of equipment shall have a nameplate bearing the manufacturer's name, address, model number, and serial number securely affixed in a conspicuous place; the nameplate of the distributing agent will not be acceptable.
- D. Modification of References: In each of the publications referred to herein, consider the advisory provisions to be mandatory, as though the word, "shall" had been substituted for "should" wherever it appears. Interpret references in these publications to the "authority having jurisdiction," or words of similar meaning, to mean the Design Engineer, or City, County, or State Building Officials.

1.04 SUBSTITUTION OF EQUIPMENT

- A. Substitution shall be in accordance with Section 00700 - GENERAL CONDITIONS OF THE CONTRACT.
- B. The Contractor shall assume full responsibility for proper fit, performance and additional work relating to other sections of the specifications.

1.05 VERIFICATION OF DIMENSIONS

- A. The Contractor shall be responsible for the coordination and proper relation of his work to the building structure and to the work of all trades. The Contractor shall visit the premises and thoroughly familiarize himself with all details of the work and working conditions, to verify all dimensions in the field, and to advise the Engineer and Owner's representative of any discrepancy before performing any work.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Handle, store, and protect equipment and materials to prevent damage before and during installation in accordance with the manufacturer's recommendations, and as approved by the Engineer and Owner's representative. Replace damaged or defective items. Rusted pipe, fittings, and accessories delivered or installed at the job site will be rejected.
- B. Materials and equipment shall be stored in weather protected locations and covered to prevent dust or moisture damage. Damage to materials or equipment due to contractor's neglect shall be repaired or replaced to the satisfaction of the architect by and at the expense of the Contractor.

1.07 INSTRUCTION TO PERSONNEL

- A. When specified in other sections, furnish the services of competent instructors to give full instruction to the designated personnel in the adjustment, operation, and maintenance, including pertinent safety requirements, of the specified equipment or system. Instructors shall be thoroughly familiar with all parts of the installation and shall be trained in operating theory as well as practical operation and maintenance work. Instruction shall be given during the first regular work week after the equipment or system has been accepted and turned over for regular operation. The number of man-days (8 hours per day) of instruction furnished shall be as specified in the individual section. When more than 4 man-days of instruction are specified, use approximately half of the time for classroom instruction. Use

other time for instruction with the equipment or system. When significant changes or modifications in the equipment or system are made under the terms of the contract, provide additional instruction to acquaint the operating personnel with the changes or modifications.

1.08 POSTED OPERATING INSTRUCTIONS

- A. Provide for each system and principal item of equipment as specified in the technical sections for the use of the operation and maintenance personnel. The operating instructions shall include the following:
1. System Descriptive Information: Wiring diagrams, control diagrams, piping diagrams, control sequence and operating points for each principal system and item of equipment. Post instructions where directed.
 2. Equipment Instructions: Attach to or post adjacent to each principal item of equipment and include directions.
 - a. Start up, proper adjustment, operating, lubrications, and shutdown procedures.
 - b. Safety precautions, procedure in the event of equipment failure.
 - c. Other areas as recommended by the manufacturer of each system or item of equipment.
 - d. Print or engrave, and frame under glass or in approved laminated plastic. Operating instructions exposed to the weather shall be made of weatherproof materials or enclosed to be weather protected. Operating instructions shall not fade when exposed to sunlight and shall be secured to prevent easy removal or peeling.

1.09 SAFETY REQUIREMENTS

- A. Fully enclose or properly guard belts, pulleys, chains, gears, couplings, projecting setscrews, keys, rotating parts, and other power transmission apparatus, located where persons can come in close proximity thereto. Provide positive means of locking out equipment so that equipment cannot be accidentally started during maintenance procedures. 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 the type specified. Ensure that access openings leading to equipment are large enough to carry through routine maintenance items such as filters and tools.

1.10 ELECTRICAL REQUIREMENTS

- A. Provide electrical components of mechanical equipment and systems such as motors, controllers, contactors and disconnects under Division 15 -MECHANICAL, specified herein, and as necessary for complete and operable systems. These components shall meet the minimum requirements as specified in Division 16 - ELECTRICAL, and all additional requirements specified in the section covering the associated mechanical equipment. Provide interconnecting wiring for components of packaged equipment as an integral part of the equipment. Interconnecting power wiring and conduit for field erected equipment shall be as specified in

February 27, 2026

Division 16 - ELECTRICAL. Control wiring and conduit shall be as specified in Division 15 - MECHANICAL.

- B. Motor control equipment forming part of motor control centers or switchgear assemblies, the conduit and wiring connecting such centers, assemblies, or other power sources to mechanical equipment shall conform to Division 16 - ELECTRICAL.

1.11 SEISMIC RESTRAINTS

- A. Provide seismic restraints for mechanical systems in accordance with the Building Code.

1.12 GUARANTEE

- A. All materials and equipment provided and/or installed under this section of the specifications shall be guaranteed for a period of one year from the date of final acceptance of the work by the Owner. Should any trouble develop during this period due to defective materials or faulty workmanship, the Contractor shall furnish all necessary labor and materials to correct the trouble without any cost to the Owner. Any defective materials or inferior workmanship noticed at time of installation and/or during the guarantee period shall be corrected immediately to the satisfaction of the Owner.
- B. Guarantee and maintenance shall run concurrently. Guarantee shall be extended to the end of the maintenance period as specified in Section 15600 - AIR CONDITIONING AND VENTILATION.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. Asbestos Prohibition: No asbestos containing materials shall be used under this section. The Contractor shall ensure that all materials incorporated in the project are asbestos-free.
- B. Materials and equipment shall conform to the requirements of applicable technical sections, publications specified therein and shall be as shown. Materials and equipment shall be new and shall be the products of manufacturers regularly engaged in the manufacture of such products. All items shall essentially duplicate materials and equipment that have been in satisfactory use at least two (2) years prior to bid opening and shall be supported by a service organization that is, in the opinion of the Engineer and Owner's representative, reasonably convenient to the site of installation.

2.02 SIMILAR PRODUCTS

- A. Shall be of the same manufacturer.

PART 3 - EXECUTION

3.01 QUALITY CONTROL

- A. The work shall be performed by workmen skilled in the type of work involved, under experienced supervision. Where methods of application or installation are specified by commercial standards in the Technical Sections, no departures will be permitted except as specified or as directed by the Engineer and Owner's representative.

3.02 INSPECTION AND TESTS

- A. The Contractor shall give the Engineer and Owner's representative notice one week in advance when the work is ready for inspection and test. The tests shall be performed as required in the Technical Sections. All work rejected by the Engineer and Owner's representative shall be repaired or replaced by the Contractor at no additional cost to the Owner.

3.03 PROTECTION OF WORK IN PROGRESS

- A. Pipe and duct openings shall be closed with caps or plugs until connections are made. Equipment shall be securely covered for protection against physical or chemical damage. In areas exposed to weather, materials unused at the end of each day's work shall be stored in weather-protected locations. Damage to materials or equipment due to the Contractor's neglect shall be repaired or replaced to the satisfaction of the Engineer and Owner's representative by, and at the expense of the Contractor. Ductwork openings shall be covered and protected from dust and moisture daily. No equipment, ductwork, piping, or insulation should be installed if contaminated by dust or moisture. Objects should be cleaned or dried before installation.

3.04 PROGRESS OF WORK AND COORDINATION

- A. The work shall be coordinated with the work of other Contractors and other trades to avoid interference, preserve headroom and operating clearances, and to expedite completion of the project.

3.05 INSTALLATION OF EQUIPMENT

- A. Installation and adjustments shall be in accordance with the equipment supplier's written instructions. All accessories required shall be properly installed and connected. Supports shall be adequately anchored and vibration isolation shall be installed where required.

3.06 TRENCHING AND BACKFILL

- A. Trench excavation shall be dug to depths shown on the drawings. If depths are not indicated, the trench shall be cut down to proper levels that will provide the minimum coverage of one foot as required by the Code.
- B. Trenching work shall be open cut excavation with banks as nearly vertical as practical, with sufficient width to provide proper working space and bottom of trench accurately graded to provide uniform slope and support.

February 27, 2026

- C. Backfill shall be either sandy or granular material such as black sand, clean beach sand, crushed fine aggregates, finely graded coral passing through 1-inch sieve or native material which does not contain lumps greater than 1 inch in diameter, organic debris, or adobe shall be used. Backfilling shall be in 6 inch layers and compacted to 95% compaction of ASTM D-1557-78. Slightly mound the backfill above the finished grade to allow for settlement.
- D. When manufacturers installation instruction differ from the above requirement, the more stringent requirement shall be followed.

3.07 PERMITS, LICENSES AND INSPECTIONS

- A. The Contractor shall obtain all permits and licenses required to perform the work, and pay all the fees therefore, and shall cooperate with all inspection required by authorities having jurisdiction. Inspection specified in the Technical Sections shall be permitted without interference. Corrections to work as a result of inspection shall be made promptly.

3.08 FIELD TESTS

- A. The Contractor shall be responsible for test of the installed work, and shall provide all labor, equipment and instruments and shall conduct pressure tests and operating tests on the piping systems and equipment. During pressure tests, all items in piping systems not designed for test pressures shall be removed from, or isolated from the system and shall be reconnected or unblocked after tests are completed. Should operating tests require the presence of manufacturer's representatives, the Contractor shall cooperate with them and shall place at their disposal all assistance, materials and service required to perform such tests. Testing shall be as specified in technical sections of these specifications.

3.09 PAINTING

- A. Painting shall be done under Section 09900 - PAINTING of these specifications. Factory finishes damaged during shipment or construction shall be touched up to provide a finish to match surrounding surfaces by the installing contractor.

3.10 CODES AND STANDARDS

- A. The entire installation shall comply with the applicable requirements of the Building Code, Plumbing Code and Fire Code of the County of Kauai, the Health Department Regulations, and applicable NFPA Standards.

END OF SECTION

SECTION 15400 - PLUMBING

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

- A. The General Instructions to Bidders, the General Conditions of Construction Contracts, Special provisions, and Section 01010 - General Requirements preceding these specifications shall govern this section of work.
- B. The Accessibility requirement in the Americans with Disabilities Act Accessibility Guidelines (ADAAG) and shall be in conformance with HRS §103-50 as required by the Americans with Disabilities Act (ADA).
- C. Related sections.
 - 1. Section 15011 – GENERAL MECHANICAL PROVISIONS
 - 2. Section 15410 – PLUMBING FIXTURES

1.02 DESCRIPTION OF WORK

- A. This section covers the furnishing, fabrication, delivery and installation of the plumbing system complete as shown on the drawings and as specified, including but not limited to the following.
 - 1. Removal of existing equipment and piping as indicated on the drawings.
 - 2. Provide new equipment and piping as indicated on the drawings.
 - 3. Provide new waste, vent, cold and hot water, medical gas piping, and all accessories.
 - 4. Hot water system including water heater, recirculation pump, expansion tank, pipe insulation.
 - 5. Operating and maintenance instructions and manuals.
 - 6. Shop drawings and record drawings.
 - 7. Inspection, testing and guarantee.

1.03 SUBMITTALS

- A. Submit under the provisions of Section 01330 – SUBMITTAL PROCEDURES.
- B. Manufacturer's Data: Submit manufacturer's specifications and installation instructions for types of insulation required. Include data substantiating that materials comply with specified requirements.
- C. Material Safety Data Sheets (MSDS): Submit MSDS for each material.

1.04 ELECTRICAL WORK

- A. Electrical motor driven equipment specified herein shall be provided complete with motors, motor starters, and controls. Electric equipment and wiring shall be in accordance with Division 16 - ELECTRICAL. Electrical characteristics shall be as indicated. Motor starters shall be provided complete with properly sized thermal overload protection and other appurtenances necessary for the motor control. Each motor shall be of sufficient capacity to drive the rating of the motor. Manual

or automatic control and protective or signal devices required but not shown on the electrical plans, shall be provided under this section of the specifications.

1.05 CODES, ORDINANCES AND PERMITS

- A. Codes and Ordinances: The work shall be in accordance with the governing State and Local Ordinances, Codes and Regulations, including NFPA Regulations and Factory Mutual, all of which are hereby made a part of these requirements. However, when these requirements and/or drawings call for or describe materials, workmanship or construction of a better quality, higher standard, or larger size than is required by the above rules and regulations, the provisions of these requirements and/or drawings shall take precedence over the requirements of the said rules and regulations. The Contractor shall furnish, without any extra charge, any additional material or labor, or both, required for compliance with these rules and regulations, although not mentioned in these requirements nor indicated on the contract drawings.
- B. Permit: The Contractor shall secure and pay for all permits, inspections and certificates of any inspection of any governmental body having jurisdiction over all or any part of the work included under this section, and/or such inspections, etc., required by these requirements.

1.06 CONTRACT DRAWINGS

- A. Contract drawings are essentially diagrammatic, indicating general layout and approximate locations towards establishing the scope for uniform estimating basis for all bidders; they are not intended to be detailed construction working drawings. Reasonable modifications to indicated locations and arrangement to suit job conditions shall not be construed as basis for requesting of additional funds from the Owner.
- B. Where apparatus and equipment have been indicated on the drawings, dimensions have been taken from typical equipment of the class indicated. The shop drawings shall show the details of construction and installation of the particular equipment furnished; they shall be fully dimensioned to show that the equipment and connections thereto fit the space provided with adequate maintenance space. If equipment is disapproved, drawings shall be revised to show acceptable equipment and resubmitted.
- C. Coordinate with the various trades. Where items must fit spaces previously constructed, verify measurements at the site. Coordinate with other work to insure that all required inserts, sleeves, and attachments are properly set and that adequate provision is made for installing this work.
- D. Capacities of all equipment and materials shall be not less than those indicated.

1.07 SHOP DRAWINGS

- A. Shop drawings shall be submitted in accordance with Section 15011 - GENERAL MECHANICAL PROVISIONS.

1.08 MATERIAL AND EQUIPMENT SUBMITTALS

- A. Material and equipment submittals shall be in accordance with Section 15011 - GENERAL MECHANICAL PROVISIONS. Material or equipment brochures shall be submitted for the following items at one time in order to demonstrate that these

February 27, 2026

items of equipment have been properly coordinated and will function properly with each other:

Dielectric Connector	Equipment Supports
Water Tank Heater	Gauges
Pipe Supports and Hangers	Pipe and Fittings
Sealants	Pipe Insulation
Valves and Accessories	Recirculation Pump
Water Hammer Arrestors	Solder Flux and Solder
Cleanouts	Thermometers

- B. If departures from the contract drawings are deemed necessary by the Contractor, details of such departures, including changes in related portions of the project and the reasons thereof, shall be submitted with the shop drawings. Approved departures shall be made at no additional cost to the Owner.
- C. Submittals shall be complete. Piecemeal submittals will be returned without review. Each submittal shall clearly identify equipment to be provided. Information not pertaining to equipment to be provided shall be deleted or crossed out.

1.09 AS-BUILT DRAWINGS

- A. As-built drawings shall be provided in accordance with Section 15011 - GENERAL MECHANICAL PROVISIONS.

1.10 WORKMANSHIP

- A. All materials and equipment shall be installed in accordance with the Building and Fire Codes of the County of Kauai to conform with the contract documents. The system shall be installed by an experienced firm regularly engaged in the design and installation of plumbing systems in accordance with the Building and Plumbing Codes of the County of Kauai. The Architect or Owner's Representative may reject any proposed installer who cannot show evidence of such qualifications. Architect's or Owner's Representative approval will not relieve the Contractor from his responsibilities to perform all work in accordance with specifications to contract terms.

1.11 INSTRUCTIONS TO OWNER

- A. The Contractor shall provide the Owner's Representative with the necessary information concerning the care, operation and maintenance of all systems, equipment, fixtures, etc.

1.12 CONFORMANCE TO AGENCY REQUIREMENTS

- A. Where materials or equipment are specified to be approved by the Underwriters' Laboratories, Inc., the Contractor shall submit proof that the items furnished under this section of the specifications conform to such requirements. The label of or listing in the Underwriters' Laboratories, Inc., Building Materials List, or the Electrical Appliance and Utilization Equipment List will be acceptable as sufficient evidence that items conform to Underwriters' Laboratories, Inc., requirements.

1.13 NAMEPLATES

- A. Each major component of equipment shall be provided with a nameplate engraved with the manufacturer's name, address, and catalog or model number, serial

number, and electrical data on a metal plate securely attached to the item of equipment. Vinyl sticker nameplates are not acceptable. When exposed to weather, all information on the manufacturer's nameplate shall be duplicated onto an engraved brass tag, minimum 3" diameter or square, secured to an accessible interior panel of the unit.

1.14 VERIFICATION OF DIMENSIONS

- A. The Contractor shall be responsible for the coordination and proper relation of his work to the building structure and to the work of all trades.
- B. The Contractor shall visit the premises and thoroughly familiarize himself with all details of the work and working conditions, to verify all dimensions in the field, and to advise the Engineer and Owner's Representative of any discrepancy before performing any work

1.15 OMISSIONS

- A. It is the intent of the plans and specifications to provide a complete installation. Should there be omissions, the Contractor shall call the attention of the Engineer to such omissions in fifteen (15) days advance of the date of bid openings so that the necessary corrections can be made. Otherwise the Contractor shall furnish and install the omissions or discrepancies as if the same were specified and provided for.

1.16 SUBSTITUTIONS OF EQUIPMENT

- A. Substitution shall be in accordance with Section 00700 - GENERAL CONDITIONS OF THE CONTRACT.
- B. The Contractor shall assume full responsibility for proper fit, performance and additional work relating to other sections of the specifications.

1.17 WELDERS QUALIFICATIONS

- A. Welders shall be qualified in accordance with Section 15011 - GENERAL MECHANICAL PROVISIONS.

1.18 PRODUCT DELIVERY AND STORAGE

- A. Furnish new equipment, fixtures, materials and accessories bearing the manufacturer's identification. Coordinate deliveries to avoid interference or construction delays. Protect products during delivery, storage, installation, and the remainder of the construction period after installation.

1.19 CLEANING EQUIPMENT AND PREMISES

- A. During the process of the work, the premises shall be kept reasonably free of all debris and waste materials resulting from the work performed under the various sections of the General Contract. All such debris and rubbish shall be removed from the site.

February 27, 2026

- B. Upon completion and before final acceptance of the work, all debris, rubbish, left over materials, tools and equipment shall be removed from the site. Plumbing equipment and fixtures shall be cleaned with an approved cleansing compound.

1.20 GUARANTEE

- A. The entire plumbing installation described herein shall be guaranteed in writing as a complete working unit for a period of one year from the date of acceptance in accordance with Section 15011 - GENERAL MECHANICAL PROVISIONS.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Asbestos Prohibition: No asbestos containing materials or equipment shall be used in this section. The Contractor shall ensure that all materials and equipment incorporated in the project are asbestos-free.
- B. All products that convey water for human consumption shall comply with lead free regulations NSF 61, "Drinking Water System Components--Health Effects," for fixture materials that will be in contact with potable water. – whether explicitly designated or not.

2.02 SOIL, WASTE AND VENT PIPE

- A. Above and below grade: Solid core schedule 40 Polyvinyl Chloride (PVC) pipe and fittings conforming to ASTM D 1785 and ASTM D 2665 joined with solvent cement conforming to ASTM D 2564 for all installation. Provide hangers every 4 feet for PVC piping.
- B. At the Contractor's option, vent piping 2-1/2 inch size and smaller may be DWV drainage fittings and 50-50 solder joints in lieu of those specified for above ground installations.

2.03 STORM DRAINAGE PIPE

- A. Above ground exposed pipes and pipes cast in concrete shall be Schedule 40 galvanized steel, ASTM A53 with galvanized cast iron threaded drainage pattern fittings, ANSI B16.4.

2.04 DOMESTIC WATER PIPE

- A. Underground pipes shall be Type "K" seamless rigid copper tubing conforming to ASTM B88 with wrought copper solder type fittings conforming to ANSI B16.22 or ANSI B16.18. Joints shall be brazed with a silver alloy filler metal.
- B. Above ground piping shall be Type "L" seamless rigid copper tubing conforming to ASTM B88 with wrought copper or cast copper alloy solder type fittings conforming to ANSI B16.22 or ANSI B16.18. Solder shall be 95-5 tin-antimony or approved equal. Pro-press fittings are not acceptable.
- C. Solder and brazing flux shall meet ASTM B813 Standard, "Specifications for Liquid and Paste Fluxes for Soldering Applications of Copper and Copper Alloy Tube."
- D. T-Drill joints are prohibited.

2.05 MEDICAL GAS SYSTEM

- A. Provide complete plumbing systems as shown on these drawings and specified. Test and guarantee all items indicated on the drawings and specifications.
- B. Medical Oxygen, Air, and Vacuum Systems
 - 1. Medical Gas Outlets on Stainless Steel Enclosure: Amico Ohmeda Diamond style two oxygen outlets, and four vacuum outlets with two slide brackets on the stainless steel enclosure. Install vacuum slide between oxygen outlet and vacuum outlet.
 - 2. Medical Gas Outlets on Power Boom: Amico Ohmeda Diamond style one oxygen outlet, one medical air outlet, and one vacuum outlet with slide bracket on Power Boom. Install vacuum slide adjacent to vacuum outlet.
 - 3. Medical Gas Outlets shall conform to NFPA 99 and CGA Z-305 standards. Medical Gas identification shall be provided by color-code for respective gas service in accordance with NFPA and CGA. Provide cross connection safety checks of outlets and pipelines after installation.
- C. Mechanical contractor shall coordinate with the general contractor to ensure that the general contractor is aware of any requirements for patching/restoration work which affect the general contractor's work resulting from the mechanical work, prior to submission of bid prices. Omission of work/cost due to lack of coordination will not be acceptable as a basis for additional cost to the owner.
- D. Installation and requirements: perform work using personnel skilled in the trade involved. Provide competent supervision. Furnish new equipment, fixtures, materials and accessories bearing the manufacturer's identification and conforming to recognized commercial standards. Provide access panels for concealed items provided under this section that require maintenance, adjustment or inspection. Provide all extra materials and labor for a complete operable system at no extra cost to the owner.
- E. Piping installation: conform to the requirements of the uniform plumbing code. Tool markings on polished fittings are not acceptable. Install pipes parallel to the wall of the structure and plumb. Install valves with stems above horizontal. Provide proper support and adequate provisions for expansion, contraction, slope and anchorage. Provide dielectric unions where copper tubing connects to steel pipe. Wrap pipe or tubing with 1/4-inch thick felt, secured with tape, where they contact other materials. Caulk watertight around pipes passing through floor penetration. Wrap pipe with polyethylene tape where it passes through floor penetration and when it contacts concrete or masonry. Grout with fire proof material around all pipe penetrations through slabs and walls full length of penetrations. Provide chrome plated brass escutcheons, set tight on the pipe and to the wall where pipes are exposed in finished areas. Provide clamping collar or membrane flange where pipe or drains penetrate waterproof membrane.
- F. Field quality control: test plumbing systems in accordance with the uniform plumbing code. Perform tests in the presence of, and to the satisfaction of inspectors having jurisdiction over the work. Ask for final-inspection by the engineer after all tests, adjustments and balancing have been performed.

2.06 MEDICAL GAS PIPING AND FITTINGS

- A. Copper Tubing: Type "K", ASTM B819, copper tube, hard drawn temper, with wrought copper fittings conforming to ANSI B16.22 or brazing fittings complying

- with MSS SP-73. Piping shall be cleaned, purged, and sealed for medical gas service or according to CGA G-4.1 for oxygen service. Size designed reflecting nominal inside diameter.
- B. Brazing Alloy: AWS A5.8, Classification BCuP, greater than 537 degrees C (1000 degrees F) melting temperature. Flux is strictly prohibited for copper-to-copper connections.
 - C. Screw Joints: Degreased polytetrafluoroethylene (Teflon) tape.
 - D. Apply piping identification in accordance with NFPA 99. Supplementary color identification shall be in accordance with CGA Pamphlet C-9.

2.07 MEDICAL GAS ZONE VALVE CABINET

- A. Medical Gas Zone Valve Cabinet: Brass or bronze body, double seal union ball valve with replaceable BUNA-N or teflon seat seals, teflon stem seal; 400 psi, working pressure, cleaned for oxygen service, blowout stem, one quarter of a turn to completely open or close. Operating parts of valve shall be removable without removing valve from line. Provide tubing extensions factory brazed, pressure tested, cleaned for oxygen service. Provide 1/8 inch NPT gauge port for a 1-1/2" inch diameter monitoring gauge downstream of shut-off-valve. Zone valves shall be products of one manufacturer, and uniform throughout unit pattern, overall size and appearance. Trim with color coded plastic inserts or color coded stick-on labels. Install valves in cabinets such that cover window cannot be in place when any valve is in closed position. Color coding for identification plates and labels as follows:

SERVICE LAB	IDENTIFICATION COLOR	MFG. STD. CLR
Oxygen	White letters on green background	Green
Medical Air	Black letters on yellow background	Yellow
Medical Vacuum	Black letters on white background	White

2.08 CLEANOUTS AND ACCESS COVERS

- A. Provide cleanouts where indicated and even if not indicated in the following locations. At junction of building drain with building sewer, at points of change in direction in horizontal drain exceeding 45 degree change of direction, at intervals of 50 feet in horizontal runs. Cleanouts shall be in the location accessible for easy removal and which will provide clearance for routing. Size shall be same as pipe served but need not be larger than 4" in any case.
 - 1. Interior wall cleanouts shall be taper thread countersunk bronze plug with stainless steel round cover and vandalproof screw.

2.09 DIELECTRIC UNIONS AND FLANGES

- A. Provide at connections between copper and ferrous metal piping materials.

February 27, 2026

1. Dielectric Unions or flanges shall be suitable for the required operating temperature and pressure. The metal parts of dielectric unions or flanges shall be separated to prevent current flow between the dissimilar metals.
2. ASTM F 441, Schedule 80, CPVC threaded pipe nipples, 4-inch minimum length, may be provided for dielectric connections in pipe sizes 2 inches and smaller.

2.10 VALVES

- A. All valves shall be suitable for 125 lb steam working pressure minimum, and in accordance with the latest edition of ASTM and ANSI specifications as indicated.

ITEM	SIZE	DESCRIPTION
Ball Valves	2" and smaller	125 psi SWP, full port ball valve, bronze two-piece body, stainless steel ball, virgin TFE seat, screwed ends, stainless steel lever handle with integral stop and with stem extension to accommodate insulation where required.

2.11 ELECTRIC WATER HEATER (COMMERCIAL)

- A. The heater shall be State, A.O. Smith Proline Standard, or an approved equal. Heater capacity and electrical characteristics shall be as scheduled on the drawings. The heater shall be vertical lowboy top connect model, 36-inch height.

2.12 HOT WATER RECIRCULATION PUMP

- A. The hot water return pump shall be centrifugal, inline type, with all bronze construction mechanical seals and flexible coupling connected to motor. Pump shall not overload the motor at any point on the pump performance curve. Capacity and other electrical characteristics as shown on drawing. A NEMA rated starter shall be furnished to suit pump operation. Pump frame shall be cast iron or galvanized welded steel construction. Motors shall be as specified in paragraph "MOTORS". Aquastat shall be provided to energize pump at 120°F or less and to de-energize at 135°F.

2.13 MOTORS

- A. All motors 1 horsepower and larger shall be NEMA "Premium Efficiency" type. Efficiency rating shall be in accordance with NEMA MG1-12.536.
- B. Motors shall have a 1.15 service factor unless otherwise specified.
- C. Motors to be used with variable speed drives shall be provided with phase isolation, Class F insulation and a winding thermostat that will detect any motor overheat conditions.
- D. Motors shall be designed to operate at full capacity with a voltage variation of plus or minus 10 percent of the motor voltage rating. Motor size shall be sufficient for the duty to be performed and shall not exceed its full load nameplate current rating when driven equipment is operated at specified capacity under the most severe conditions likely to be encountered. When motor size provided differs from the size indicated or specified, the Contractor shall make the necessary adjustments

February 27, 2026

to the wiring, disconnect devices, and branch circuit protection to accommodate the equipment actually provided.

- E. Provide a motor starter for each motor.

2.14 WATER-HAMMER ARRESTERS

- A. Provide where indicated in water-supply distribution system water hammer arresters TYPE AND SIZE as per manufacturer, Sioux Chief, Smith, Zurn, Watts, Wade, or Josam and approved by the Plumbing and Drainage Institute, Standard No. 201.

2.15 FLASHING

- A. Plumbing vent through roof flashing shall be 4 pounds per square foot sheet lead.

2.16 PIPING INSULATION

- A. All insulation material applied to the exterior surface of metal pipes shall have flame spread of not more than 25 and a smoke development rating of not more than 50 when tested as a composite installation, including insulation, facing material, tapes and adhesives as normally applied.
- B. All hot water supply, return lines, and all cold water lines in crawl space except small fixture branches shall be insulated with Owens/Corning Fiberglass 25ASJ/SSL insulation with an embossed vapor barrier laminate sealed with pressure adhesive tape. Insulation shall be 1" thick for pipe size 2" and smaller and 1.5" thick for pipes 2.5" and larger. Fitting and valve shall be insulated with segments of insulation coated with fitting mastic, then applied over fiberglass reinforcing cloth and coated with another coating of fitting mastic.
- C. All insulation exposed to weather and in crawl space or exposed within 7'-0" of floor shall be provided with 0.016" thick aluminum jacket. Installation of snap and metal band shall be as recommended by manufacturer.
- D. Accessible Sinks and Lavatories - Drain piping and water piping insulation shall be molded closed cell vinyl with anti-microbial additive. Installation shall be in compliance with the Americans with Disabilities Act. Insulation shall be self extinguishing and as manufactured by Truebro, McGuire Products, Brocar Products or approved equal.
 - 1. Insulation shall be Armacell Armaflex II or approved equal. Finish color shall be as specified by Architect.

2.17 VIBRATION ISOLATORS

- A. All isolators and fasteners exposed to weather shall be hot dipped galvanized. Isolators shall be as manufactured by Mason, Vibrex, Vibro Acoustics, Korfund or approved equal.
 - 1. Neoprene Isolators: Double deflection neoprene mountings shall have a minimum static deflection of 0.35". All metal surfaces shall be neoprene covered to avoid corrosion and have friction pads both top and bottom so they need not be bolted to the floor. Bolt holes shall be provided for these areas where bolting is required. On equipment such as small vent sets and close coupled pumps, steel rails shall be used above the mountings to

compensate for the overhang. Mountings shall be type ND or rails type DNR as manufactured by Mason Industries, Inc.

2. Spring Mount Isolators: Spring type isolators shall be free standing and laterally stable without any housing and complete with 1/4" neoprene acoustical friction pads between the baseplate and the support. All mountings shall have leveling bolts that must be rigidly bolted to the equipment. Spring diameters shall be no less than 0.8 of the compressed height of the spring at rated load. Springs shall have a minimum additional travel to solid equal to 50% of the rated deflection.
 - a. Submittals shall include spring diameters, deflections, compressed spring height and solid spring height. Mountings shall be type SLF as manufactured by Mason Industries, Inc.
3. Spring/Neoprene Hanger Isolator: Vibration hangers shall contain a steel spring and 0.3" deflection neoprene element in series. The neoprene element shall be molded with a rod isolation bushing that passes through the hanger box. Spring diameters and hanger box lower hole sizes shall be large enough to permit the hanger rod to swing through a 30° arc before contacting the hole and short circuiting the spring. Springs shall have a minimum additional travel to solid equal to 50% of the rated deflection. Submittals shall include a scale drawing of the hanger showing the 30° capability. Hangers shall be type 30N as manufactured by Mason Industries, Inc.

2.18 THERMOMETER

- A. Mercury thermometer, Trerice, Weksler, Weiss, or equal, 9-inch scale with adjustable angle cast aluminum case, range 30°F to 240°F, remote type dial thermometers shall have a 4" to 4-1/2" dial face, cast aluminum case, mercury actuated and 30°F to 240°F scale.
- B. Accuracy shall be within 1 percent of full scale. Thermometers shall be provided with a cast bronze thermometer well to allow replacing the thermometer without shutting down any system.

2.19 PRESSURE GAGE

- A. 4" to 4-1/2" dial bourdon tube with gage cock, cast aluminum case, 300 psi rating. 0-150 psi scale Weksler, Trerice, Foxboro or equal. Gage shall have an accuracy of one-half of one percent of full scale range. All gages shall be provided with a pressure snubber and gage cock.

2.20 PIPE SUPPORT

- A. Products of Anvil, Superstrut, B-Line, Erico or approved equal. Hangers, supports and accessories used shall be applied in accordance with the manufacturer's recommendation for type of service and application. All supports, rods and accessories shall be galvanized. In addition, supports for copper pipe shall be plastic coated.

2.21 SEALANT

- A. Sealants shall be in accordance with Section 07920 - SEALANTS. Elastomeric sealant complying with ASTM C 920, Type S, Grade NS, Class 25, Use NT, formulated with fungicide: intended for sealing interior joints with non-porous

February 27, 2026

substrates and subject to in-service exposure to conditions of high humidity and temperature extremes. Sealant shall be Dow Corning 786, SCS 1702 sanitary - General Electric Corp., Proglaze White - Tremco, Inc. or OmniPlus - Sonneborn.

2.22 PLUMBING FIXTURE

- A. As specified in section 15410.

PART 3 - EXECUTION

3.01 PIPE INSTALLATION

- A. Underground piping shall be installed promptly after excavating for same, keeping all excavations open as short a time as possible. However, piping shall not be permanently closed up, furred in or covered over before it has been tested and inspected, and approved by the Plumbing Inspector and Architect.
- B. Horizontal storm drain, soil and waste piping shall be installed straight as possible to a uniform grade of not less than 1/4 inch per foot unless otherwise shown or directed. Vent piping graded to provide proper venting of the plumbing and to free itself of condensation.
- C. Openings in pipes, drains, fittings, apparatus and equipment shall be sealed or securely plugged during erection, to prevent accumulating obstructions in same.
- D. Sewer and water pipes shall not run or be laid in the same trench. A distance of minimum 2 feet shall be kept at all times. Except when crossing, the bottom of water piping at all points shall be at least twelve inches above the top of the sewer pipe.
- E. All pipe appurtenances subject to unbalanced thrust shall be properly braced with concrete reaction blocks and/or tie rods.
- F. Piping except where specifically shown otherwise, shall be concealed in walls, utility chases, partitions, ceiling spaces and roof spaces. Piping shall be installed to maintain headroom and keep passageways and access openings clear. Where necessary, piping shall offset to maintain the required clearances to coincide with structural features of building.
- G. Springing, bending or forcing of pipe into place is not allowed; fittings shall be used for all offsets or changes in alignment of piping.
- H. Rough outlets for all fixtures shall be set exactly to the measurements furnished by the manufacturer; fixtures in batteries with their rough outlets set in a straight line at equal spacing.
- I. Each water branch connection to fixtures, including hose bibbs, shall be controlled by independent loose key stops. All exposed piping at fixtures shall be brass or copper with chrome plated finish.
- J. Exposed pipes penetrating walls, ceilings, and floors shall be provided with chrome plated brass escutcheons. Pipes located in cabinets shall be considered exposed.
- K. Copper pipe shall be isolated from direct contact with ferrous piping connections by approved isolating (dielectric) unions or couplings, and from contact with dissimilar metals outside of system by taping pipe at point of contact with plastic electricians tape.

February 27, 2026

- L. Damaged or otherwise defective piping, or piping showing excessive wrench marks, shall be replaced with new materials.
- M. Verify fixture rough-in height and location with architectural drawings.
- N. Medical gas piping shall installed in accordance with NFPA 99 and OSHPD. Cleaning of medical gas piping, valves and fittings to be done in accordance with NFPA 99.
- O. All medical gas piping and equipment shall be seismically restraining in accordance with the IBC and OSHPD.
- P. Keep open ends of medical gas piping capped or plugged at all times or otherwise sealed until final assembly.
- Q. Cut medical gas piping accurately with pipe/tube cutter (sawing not permitted) to measurements determined at place of installation. Ream pipe to remove burrs, being careful not to expand pipe, and so no chips of copper remain in the pipe. Work into place without springing or forcing. Bottom medical gas piping in socket so there are no gaps between piping and fitting. Exercise care in handling equipment and tools used in cutting and reaming of pipe to prevent oil or grease being introduced into tubing. Where contamination has occurred, material is no longer suitable for medical gas service.
- R. Spacing of Hangers: NFPA 99 and OSHPD.
- S. Rigidly support valves and other equipment to prevent strain on piping or joints. Do not bend or spring piping. Use fittings.
- T. Apply medical gas pipe labeling during installation process and not after installation is completed. Size of legend letters shall be in accordance with ANSI A13.1 and NFPA 99.
 - 1. Equipment Installer: Show technical qualifications of previous experience in installing medical gas equipment on three similar projects. Submit names, ASSE 6010 certification letter, and addresses of referenced projects.
 - 2. Independent Medical Gas System Testing Organization:
 - a. Testing agency that is financially independent of medical gas equipment manufacturer, supplier, and installer.
 - b. Provide names of three projects where testing of medical gases and systems has been performed by the testing agency. Include name of the project, names of such persons at that project who supervised the work for the project owner, or who accepted the report for the project owner, and written statement that projects listed required work of similar scope to that set forth in his specification.
 - c. Submit the testing agency's detailed procedure which will be followed in the testing of this project. Include details of the testing sequence, procedures for cross connection tests, outlet function tests, ceiling column function tests, alarm tests, purity tests, as required.
- U. After initial leakage testing of medical gas piping is completed, allow piping to remain pressurized with testing gas until testing agency performs final tests.

3.02 PIPE SUPPORTS, HANGERS, INSERTS

- A. Install hangers and supports for all pipe work to provide for expansion and contraction, prevent vibration and maintain required grading by proper adjustment. Supports, hangers, bolts, nuts, and washers shall be galvanized unless otherwise specified. Supports for copper pipe shall be additionally coated with plastic.
- B. Refer to structural drawings and as built drawings for type of construction from which piping and/or equipment is to be supported. Support from metal decking is prohibited unless specifically approved by the Structural Engineer.
- C. Support horizontal overhead pipes or under crawl space with clevis hangers, rods inserts, clamps, on suspension suitable for type of building construction.
- D. Support horizontal pipes which are close to floor with pipe rest and floor flange or pipe roll stand on piers.
- E. Support horizontal pipes from walls with "J" hooks, or hangers suspended from wall brackets.
- F. Support vertical pipes at base of the pipe on every floor and at 10' intervals maximum with galvanized steel pipe clamps, special cast iron pipe rests, base fittings, or by other approved methods suitable for type of building construction.
- G. Horizontal Pipe Support Schedule:
 - 1. Support all piping at intervals in accordance with the Plumbing Code or requirements of this section, whichever is more stringent.
 - 2. Support horizontal lines of copper tubing with hangers spaced not more than 6 feet, center to center for all pipe sizes. All pipes shall be supported at elbows, branches and risers.
 - 3. Horizontal pipe support spacing and hanger rod size shall conform to the following table:

Pipe Material	Max. Hanger Spacing (feet)	Hanger Rod Diameter (inches)
Copper Tube: 2 inches and smaller	6	3/8
Copper Tube: 2 to 5 inches and larger	6	1/2
PVC and ABS DWV	4	3/8 (minimum)

- H. Pipes connected to equipment supported with vibration isolators shall be supported with spring isolators having a minimum static deflection equal to vibration isolator supporting the equipment but need not exceed 1-1/2" static deflection.
 - 1. Pipes 1-1/2" and smaller within ten feet run from the equipment connection shall be supported with spring isolators.
 - 2. Pipes 2" and larger within twenty feet run from the equipment connection shall be supported with spring isolators.

February 27, 2026

3. In addition to the above specified locations, pipes shall be hung from spring isolator.

3.03 PIPE INSULATION

- A. Insulate all hot water supply pipe up to individual fixture branches.
- B. Insulate all cold water pipes exposed in crawl space.
- C. Insulate all hot water return pipes.
- D. All individual fixture branches more than 10 feet long shall be insulated to within 2 feet of the fixture.
- E. Insulate tailpiece, trap, trap arm and water supply pipes at accessible sinks and lavatories.

3.04 WATER HAMMER ARRESTOR

- A. Group of plumbing fixtures shall be protected from hydraulic shock by installing water hammer arrestor where indicated on plans.

3.05 VIBRATION ISOLATORS

- A. Provide vibration isolators to vibrating and/or dynamic equipment, and install per equipment manufacturer's instructions. Electrical conduit connections to isolated equipment shall be looped to allow free motion of isolated equipment. Provide flexible connectors at piping and ductwork that is connected to isolated equipment.

3.06 SLEEVES

- A. Contractor shall, unless otherwise specified elsewhere, furnish and install pipe sleeves for all pipes which pass through foundations, walls, partitions, floors, ceilings or roofs, in accordance with the following:
 1. Sleeves for piping, tubing, etc., unless otherwise modified or specified, shall be of standard schedule 40 black steel pipe with ends cut square and reamed and of sufficient length to flush with finished surfaces at both ends of sleeves.
 2. Sleeves for piping which pass through foundations and are below the ground shall be cast iron or ductile iron pipe. Space between pipe and sleeves (both ends) shall be thoroughly caulked with packed tarred oakum and lead wool or packed tarred oakum and poured lead to make a waterproof installation.
 3. Spaces between pipe and floor sleeves shall be sealed with U.L. listed fire stopping material for the full depth of the floor.
 4. No cutting or drilling of any structural members will not be permitted without the approval from the Architect.
 5. Where applicable all sleeves shall meet the requirements specified in Section 15200 - NOISE, VIBRATION AND SEISMIC CONTROL.

3.07 VENT PIPE FLASHING

- A. All pipes through roof shall be flashed and counter-flashed to provide a water tight installation with a four-pound sheet lead, with base extending out 4" on roof all around pipe and at least 6" high into a counterflashing sleeve on the pipe or returned 1" down into pipe. Sheet lead shall be seamless or burned in with pure

lead, solder will not be permitted. Work shall be performed in coordination with roofing work.

3.08 PUMPS

- A. The pump shall be mounted level and installed in such a manner as to allow the complete removal without dismantling or removal of piping or valves.
- B. Adjacent piping shall be carefully fitted and erected so that the pump can be installed or removed from the piping without forcing or springing.
- C. Flexible connectors and pressure gauges shall be installed at the inlet and outlet of all pumps. Isolation gate valves and strainers shall be installed at the inlets of all pumps. A check valve and plug cock shall be installed at the outlets of all pumps.
- D. After the system has been completed and pump started, the pump and system shall be checked for vibration and excessive noise and any such noise or vibration shall be immediately corrected.

3.09 THERMOMETERS

- A. Thermometers shall be installed at the inlet and outlet of all water heaters, heat exchangers and where shown on drawings.
- B. Thermometers shall be installed so they can be read by standing on the floor without the use of ladders.

3.10 PRESSURE GAUGES

- A. Pressure gauges shall be installed at the inlet and outlet of all pumps and pressure control valves, at the outlets of commercial water heaters and boilers, at the outlets of pressure vessels and where shown on drawings.
- B. Pressure gauges shall be installed with gauge cock and pressure snubbers to provide easy replacement and protection from pressure surges.
- C. Pressure gauges shall be installed so they can be read while standing on the floor without the use of ladders.

3.11 DIELECTRIC UNIONS AND FLANGES

- A. Dielectric unions or flanges shall be installed when connecting dissimilar metal water piping, accessories or equipment.
- B. Copper water piping shall be isolated from ferrous material such as metal studs, hanger or clamps by wrapping the pipe with plastic electrician's tape.

3.12 FIXTURE INSTALLATION

- A. Each fixture shall be installed at the exact height and location shown on architectural drawings, or as directed.
- B. Fixture supplies, trap and trap arm shall be set square with wall, in line with fixture outlets without any offsets, angles, or bends.
- C. Each fixture shall be set level and in continuous contact with floor or wall; fixture in batteries shall be set on one line, at equal spacing.

- D. Joints between fixtures and walls or floor shall be adequately sealed, forming a smooth, even watertight joint. China caps shall be securely sealed into place over floor flange bolts, entirely covering washer and bolt hole.
- E. Wall Supports: Proper provisions for supporting all wall hung plumbing fixtures are totally within the scope of this section of the specifications. All metal supports shall receive one coat of red lead and oiled before erection.
- F. Chrome plated brass wall escutcheons shall be provided for all piping. Exposed piping shall be chrome plated. Pipe within cabinets shall be considered exposed and shall therefore be chrome plated.

3.13 VALVE TAGS AND INDEX

- A. Identification tags made of brass or aluminum shall indicate valve number, function, size, and working pressure and shall be installed on all valves. Tags shall be 1-1/2 inches minimum in diameter, and marking shall be stamped. Tags shall be wired to valve with 0.0808-inch diameter, No. 12 AWG, copper wires. Furnish a chart indicating location, index number and purpose of all valves for the Architect's review and approval.

3.14 STANDARDIZED PIPE IDENTIFICATION SYSTEM

- A. Use an arrow marker with each pipe content marker, the arrow shall always point away from the pipe marker and in the direction of the flow.
- B. If flow can be in both directions, use a double headed arrow marker.
- C. Apply pipe marker and arrow marker at every point of pipe entry or exit where line goes through wall.
- D. Apply pipe marker and arrow marker on each riser and "T" joint.
- E. Apply pipe marker and arrow marker every 20 feet on long continuous lines.
- F. Apply markers on the two lower quarters of the pipe and where view is unobstructed.
- G. Arrow markers shall be 4 inches long minimum, and pipe content marker lettering sizes shall be 1-1/2 inches minimum in height.

3.15 TESTING AND ADJUSTING

- A. All work completely installed and tested as required by this section and the applicable plumbing ordinances, and proven leak tight before inspection is required. Providing of all required equipment and labor to make the test and repeating of the tests to the satisfaction of those making the inspection is within the scope of this section of the specifications.
- B. Any work concealed without the required test and approval shall be uncovered and tested at the Contractor's expense.
- C. Procedure:
 - 1. Soil, waste and vent piping: Filled with water to the highest point in each system, and left filled for eight hours with no noticeable change in water level; after approval, remove the test plugs and flush the line.

February 27, 2026

2. Water Piping: At 150 psi and left for an eight hour period without loss of pressure; and left under line pressure for the balance of the construction period.
3. Plumbing Fixtures: Filled with water and checked for leaks and/or retarded flow.
4. All Valves: Adjusted and balanced to provide for the proper operation of the various systems. After disinfecting, strainer screens shall be removed, cleaned and reinstalled.

3.16 DISINFECTING

- A. All domestic cold and hot water lines shall be thoroughly flushed and drained after installation. Sterilization shall be accomplished by opening taps at the end of all branches, and slowly filling the system adding liquid chlorine, or hypochlorite solution, to the water until water flowing from all branches indicates not less than 50 P.P.M. residual chlorine; the system allowed to stand for not less than twenty-four (24) hours, [200 PPM for 3 hours] with all valves opened and closed several times during this period; then drained and thoroughly flushed until all traces of chlorine are eliminated (less than 0.2 P.P.M.) Certificate shall be submitted to the Architect. The Contractor shall be responsible for the proper disposal of chlorinated water to safeguard public health and environment in accordance with applicable Department of Health requirements.

3.17 INSTRUCTIONS FOR OPERATION AND BROCHURES

- A. Contractor shall submit a complete bound set of operating and maintenance instructions in accordance with Section 15011 - GENERAL MECHANICAL PROVISIONS.

3.18 PAINTING

- A. Painting shall be as specified in Section 09900 - PAINTING.

3.19 SPARE-PARTS DATA

- A. After approval of materials and equipment and 2 months prior to the date of beneficial occupancy, the Contractor shall furnish a complete list of parts and supplies, with current source of supply.

3.20 PIPE PENETRATION

- A. Where pipes penetrate fire rated walls and floors the space between the pipe and pipe sleeve shall be sealed with fireproof sealant.
- B. Installation shall be in accordance with manufacturer's instructions.

END OF SECTION

SECTION 15410 - PLUMBING FIXTURES

PART 1 - GENERAL

1.01 SUMMARY

- A. This section includes plumbing fixtures and trim.

1.02 SUBMITTALS

- A. Submit under the provisions of Section 01330 – SUBMITTAL PROCEDURES.
- B. Manufacturer's Data: Submit manufacturer's technical data for all materials.
- C. Operation and Maintenance Data: Submit operation and maintenance data including maintenance schedules, spare parts requirements, and procedures.

1.03 QUALITY ASSURANCE

- A. Single Source: Provide similar plumbing fixtures and trim from a single manufacturer.
- B. All work shall conform to the current edition of the Uniform Plumbing Code.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Acceptable Manufactures:
 - 1. Fixtures: Kohler, American Standard, Crane, Eljer, or approved equal.
 - 2. Faucets: Kohler, American Standard, Eljer, Moen, Sloan, Chicago, or approved equal.
 - 3. Water Closet Seats: Kohler, American Standard, Olsonite, Beneke, or approved equal.
 - 4. Electric Water Coolers and Drinking Fountains: Haws, Halsey Taylor, Elkay, or approved equal.
- B. Where applicable, refer to the Index Creations cross reference "Blue Books". Fixtures, fittings, equipment or appliances listed as similar in the "Blue Books" shall be acceptable under this paragraph. Prequalification is not required.
- C. All fixtures shall include accessories to comply with the energy conservation and water conservation requirements of the Building Code and Plumbing Code of the County of Kauai.
- D. All fixtures designated "Accessible" shall conform to the accessible requirements of the Building Code of the County of Kauai, and Americans with Disabilities Act Accessibility Guidelines (ADAAG).
- E. All products that convey water for human consumption shall comply with lead free regulations NSF 61, "Drinking Water System Components--Health Effects," for fixture materials that will be in contact with potable water. – whether explicitly designated or not.

- F. Faucet hole covers shall be provided for extra faucet holes. Faucet hole covers shall be polished stainless steel.
- G. All plumbing fixtures shall include stops, P-traps, trap arms and escutcheons of the following type unless otherwise specified.
 - 1. Stops shall be chrome plated brass with compression fittings, chrome plated copper tubing risers and chrome plated brass escutcheons.
 - 2. P-traps and Trap Arm shall be 17 gauge chrome plated brass with slip joint. Slip joints which are not accessible, such as tub waste fittings, shall be soldered.
- H. Electronic sensor operated valves, or faucets shall be 120 volts UL Listed, or 24 volts UL Listed with transformer supplied with the valve, or faucet. Wiring up to and including a junction box in the plumbing wall space shall be provided and installed under Division 16 of these specifications. All wiring from junction box provided in the plumbing wall space to valves and sensor shall be provided and installed under this section of the specifications in accordance with applicable sections of Division 16 - ELECTRICAL. All wiring including 24 volt wiring shall be placed in conduit.
- I. The following general description are given for quality only. Substitutes are acceptable if approved in writing by the Architect.

2.02 FIXTURE SCHEDULE

- A. Water Closet Accessible: Shall be floor mounted, floor outlet, Zurn EcoVantage 1.28 gallons per flush maximum flush valve, siphon jet, elongated bowl, vitreous china with mounting bolts, washers, china bolt caps, 1-1/2" top spud and 2-1/4" waste passageway. Battery powered flush valve. Toilet seat height above floor must be 17 to 19 inches for accessible water closet. See architectural drawing for mounting height.
 - 1. Seat: White solid plastic commercial weight elongated open front seat with self sustaining check hinges.
 - 2. Provide all accessories for a complete installation.
- B. Accessible Lavatory: Wall hung lavatory American Standard Lucerne 0356.041, 4 inch center, vitreous china, front overflow and back splash with concealed arm floor mounted support. Elkay single hole faucet with 4" wristblade handle chrome, aerator with faucet. Piping cover for P-trap, valves, and exposed drain piping per ADA requirement. Provide mixing valve with faucet for 110 degree of hot water at fixture. Provide 1-1/4" chrome-plated brass tailpiece with integral perforated strainer, angle valves, and all accessories for a complete installation.
 - 1. See Architectural drawings for lavatory mounting heights. Mounting height for accessible lavatories shall be in accordance with the accessible clearance requirements of the County of Kauai Building Code and ADAAG. Fixture substitutions shall show that they meet the accessible clearance requirements of the Building Code and ADAAG.
 - 2. Drain piping and water piping insulation shall be molded closed cell vinyl with anti-microbial additive. Installation shall be in compliance with the Americans with Disabilities Act. Insulation shall be self extinguishing and as

manufactured by Truebro, McGuire Products, Brocar Products or approved equal.

- C. Hand Sink: Elkay Dayton stainless steel single bowl drop-in sink, satin finish, center drain. Elkay single hole faucet with 4" wristblade handle chrome, aerator with faucet. Provide mixing valve with faucet for 110 degree of hot water at fixture. Provide all accessories for a complete installation.
- D. Accessible Shower: Provide ball joint self-cleaning adjustable shower head, pressure balancing mixing valve with trim, hand shower with variable flow lever, metal hose and slide bar with integral vacuum breaker. Provide WaterSense labeled shower head with a maximum flow rate of 1.75 gpm.
- E. Scupper Drain: Zurn z1717, stainless steel 304 body, cast aluminum oblique grate and two piece clamp collar.

PART 3 - EXECUTION

3.01 FIXTURE INSTALLATION

- A. Set all plumbing fixtures in an approved workmanlike manner. Point up edges against wall with approved sealant.
- B. Flanges at wall penetrations shall be flush against wall and shall not spin when rotated by hand.
- C. Adjust equipment and plumbing fixtures and trim to operate properly and clean all fixtures just prior to final inspection.
- D. Rough outlets for all fixtures shall be set exactly to the measurements furnished by the manufacturer; fixtures in batteries with their rough outlets set in a straight line at equal spacing.
- E. Verify fixture rough-in height and location with architectural drawings.
- F. Each fixture shall be installed at the exact height and location shown on architectural drawings, or as directed.
- G. Fixture supplies, trap and trap arm shall be set square with wall, in line with fixture outlets without any offsets, angles, or bends.
- H. Each fixture shall be set level and in continuous contact with floor or wall; fixture in batteries shall be set on one line, at equal spacing.
- I. Joints between fixtures and walls or floor shall be adequately sealed, forming a smooth, even watertight joint. China caps shall be securely sealed into place over floor flange bolts, entirely covering washer and bolt hole.
- J. Wall Supports: Proper provisions for supporting all wall hung plumbing fixtures are totally within the scope of this section. All metal supports shall receive one coat of red lead and oiled before erection.
- K. Chrome plated brass wall escutcheons shall be provided for all piping. Exposed piping shall be chrome plated. Pipe within cabinets shall be considered exposed and shall therefore be chrome plated.

February 27, 2026

3.02 TESTING AND ADJUSTING

- A. All work completely installed and tested as required by this section and the applicable plumbing ordinances, and proven leak tight before inspection is required. Providing of all required equipment and labor to make the test and repeating of the tests to the satisfaction of those making the inspection is within the scope of this section of the specifications.
- B. Procedure:
 - 1. Plumbing Fixtures: Filled with water and checked for leaks and/or retarded flow.
 - 2. All Valves: Adjusted and balanced to provide for the proper operation of the various fixtures. After disinfecting, strainer and aerator screens shall be removed, cleaned and reinstalled.

3.03 SPARE-PARTS DATA

- A. After approval of materials and equipment and 2 months prior to the date of beneficial occupancy, the Contractor shall furnish a complete list of parts and supplies, with current source of supply.

END OF SECTION

SECTION 15600 - AIR CONDITIONING AND VENTILATION

PART 1 - GENERAL

1.01 SUMMARY

- A. This section covers the furnishing, fabrication, delivery and installation of the air conditioning and ventilation systems complete, including but not limited to the following:
1. Ventilation system.
 2. Air conditioning units, controls and wiring.
 3. Air diffusers, registers, and grilles.
 4. Air filters.
 5. Sheet metal duct, and duct insulation.
 6. Vibration Isolation.
 7. Pipe Insulation.
 8. Operation and maintenance instructions.
 9. Manufacturer's literature, shop drawings, and record drawings.
 10. Inspection, test, and guarantee.
 11. One year maintenance service.

1.02 ELECTRICAL WORK

- A. Electrical motor driven equipment specified herein shall be provided complete with motors, motor starters, and controls. Electric equipment and wiring shall be in accordance with Division 16 - ELECTRICAL. Electrical characteristics shall be as indicated. Motor starters shall be provided complete with properly sized thermal overload protection and other appurtenances necessary for the motor control. Each motor shall be of sufficient capacity to drive the rating of the motor. Manual or automatic control and protective or signal devices required but not shown on the electrical plans, shall be provided under this section of the specifications.

1.03 CODES, ORDINANCES AND PERMITS

- A. Codes and Ordinances: The work shall be in accordance with the governing State and Local Ordinances, Codes and Regulations, including NFPA Regulations and Factory Mutual, all of which are hereby made a part of these requirements. However, when these and/or drawings call for or describe materials, workmanship or construction of a better quality, higher standard, or larger size than is required by the above rules and regulations, the provisions of these requirements and/or drawings shall take precedence over the requirements of the said rules and regulations. The Contractor shall furnish, without any extra charge, any additional material or labor, or both, required for compliance with these rules and regulations, although not mentioned in these requirements nor indicated on the contract drawings.

- B. Permits: The Contractor shall secure and pay for all permits, inspections and certificates of any inspection of any governmental body having jurisdiction over all or any part of the work included under this section, and/or such inspections, etc., required by these requirements.

1.04 CONTRACT DRAWINGS

- A. Contract drawings are essentially diagrammatic, indicating general layout and approximate locations towards establishing the scope for uniform estimating basis for all bidders; they are not intended to be detailed construction working drawings. Reasonable modifications to indicated locations and arrangement to suit job conditions shall not constitute basis for requesting of additional funds from the Owner.
- B. Where apparatus and equipment have been indicated on the drawings, dimensions have been taken from typical equipment of the class indicated. The shop drawings shall show the details of construction and installation of the particular equipment furnished; they shall be fully dimensioned to show that the equipment and connections thereto fit the space provided with adequate maintenance space.
- C. Capacities of all equipment and materials shall be not less than those indicated.

1.05 SUBMITTALS

- A. Submit under the provisions of Section 01330 – SUBMITTAL PROCEDURES and Section 15011 - GENERAL MECHANICAL PROVISIONS.
- B. Product Data:
 - 1. Material or equipment brochures shall be made in a single submittal for the following items in order to demonstrate that these items of material and equipment have been properly coordinated and will function properly with each other:
 - a. Air Filter
 - b. Dampers
 - c. Diffusers, Registers, Grilles
 - d. Drain
 - e. Duct Access Doors
 - f. Duct Insulation
 - g. Duct Sealer
 - h. Duct Work
 - i. Equipment Supports
 - j. Fan Coil, Air Handling Unit
 - k. Flexible Duct Connectors
 - l. Flexible Pipe Connectors
 - m. Gauges and Thermometers

February 27, 2026

- n. Hi-Efficiency Motors
 - o. Pumps Pipe Insulation
 - p. Temperature Controls
 - q. Smoke Detectors
 - r. Ventilation Fans, Blowers
 - s. Valves and Accessories
 - t. Vibration Isolators
2. If departures from the contract drawings are deemed necessary by the Contractor, details of such departures, including changes in related portions of the project and the reasons therefore, shall be submitted with the shop drawings. Approved departures shall be made at no additional cost to the Owner.
- C. Shop Drawings.
- D. Operation and Maintenance Data: Submit operation and maintenance data including maintenance schedules, spare parts requirements, and procedures.
- E. As-Built Drawings:
- 1. The Contractor shall maintain at the job site one set of full size contract drawings, marking them in red to show all variations between the construction actually provided and that indicated or specified in the contract documents, including buried or concealed construction.
 - 2. Where a choice of material or method is permitted herein or where variations in scope or character of work from that of the original contract or authorized, the drawings shall be marked to define the construction actually provided. Where equipment installation is involved, the size, manufacturer's name, model number, power input or characteristic as applicable shall be shown on the as-built drawings.
 - 3. The representation of such changes shall conform to standard drafting practice and shall include such supplementary notes, legends, and details as necessary to clearly portray the as-built construction.
 - 4. The drawings shall be maintained and updated on a daily basis. The Contractor shall sign, and date each sheet to certify that the dimensions and details shown on the drawings reflect the dimensions and details, and specifications as constructed in the field. As-built drawings shall be provided in accordance with Section 15011 - GENERAL MECHANICAL PROVISIONS.
- F. Welder's Qualifications: All welders shall be certified, by an independent testing laboratory and certificates shall be submitted to the Architect for approval. Testing of welders shall be in accordance with the welding section of ANSI B-31.09 "Building Services Piping".
- G. Warranty: The entire mechanical installation described herein shall be guaranteed in writing as a complete working unit for a period of one year starting only after 30 days of trouble free operation after the date of system acceptance. Other

February 27, 2026

requirements shall be in accordance with Section 15011 - GENERAL MECHANICAL PROVISIONS.

1.06 CONFORMANCE TO AGENCY REQUIREMENTS

- A. Where materials or equipment are specified to be approved by the Underwriters' Laboratories, Inc., the Contractor shall submit proof that the items furnished under this section of the specifications conform to such requirements. The label of or listing in the Underwriters' Laboratories, Inc., Building Materials List, or the Electrical Appliance and Utilization Equipment List will be acceptable as sufficient evidence that items conform to Underwriters' Laboratories, Inc., requirements.

1.07 NAMEPLATES

- A. Each major component of equipment shall be provided with a nameplate engraved with the manufacturer's name, address, and catalog number, serial number and electrical data on a metal plate mechanically attached to the item of equipment.

1.08 VERIFICATION OF DIMENSIONS

- A. The Contractor shall be responsible for the coordination and proper relation of his work to the building structure and to the work of all trades. The Contractor shall visit the premises and thoroughly familiarize himself with all details of the work and working conditions, to verify all dimensions in the field, and to advise the Architect of any discrepancy before performing any work. Fabrication of ductwork and piping shall be in accordance with field measurements.

1.09 OMISSIONS

- A. It is the intent of the plans and specifications to provide a complete installation. Should there be omissions, the Contractor shall call the attention of the Architect to such omissions in 15 days advance of the date of bid openings so that the necessary corrections can be made.

1.10 SUBSTITUTIONS OF EQUIPMENT

- A. Substitutions shall be in accordance with Section 00700 - GENERAL CONDITIONS OF THE CONTRACT.
- B. The Contractor shall assume full responsibility for proper fit, performance and additional work relating to other sections of the specifications.
- C. Redesign made necessary by the use of approved substitutions shall be the responsibility and at the expense of the Contractor.

1.11 CLEANING EQUIPMENT AND PREMISES

- A. During the process of the work, the premises shall be kept reasonably free of all debris and waste materials resulting from the work performed under the various sections of the General Contract. All such debris and rubbish shall be removed from the site.
- B. Upon completion and before final acceptance of the work, all debris, rubbish, left over materials, tools and equipment shall be removed from the site.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Asbestos Prohibition: No asbestos containing materials shall be used under this section. The Contractor shall ensure that all materials incorporated in the project are asbestos-free.
- B. Foreign Products shall not be allowed on this project unless specifically approved by the Design Engineer and is clearly shown to be superior to the American product.

2.02 SPLIT PACKAGED DUCTLESS AIR CONDITIONING UNIT

A. Outdoor Unit

- 1. Outdoor condensing unit suitable for on-the-ground or wall hung installation. Unit shall consist of a hermetic or rotary compressor, an air-cooled coil, propeller-type blow-through outdoor fans, accumulator, full refrigerant charge, and control box. Unit shall discharge air horizontally as shown on the contract drawings. Units shall function as the outdoor component of an air-to-air cooling system.
- 2. Units shall be used in a refrigeration circuit matched to a duct-free cooling fan coil unit or an approved ducted cooling fan coil unit. Unit cabinet shall be constructed of galvanized steel, bonderized and coated with a baked-enamel finish.
- 3. Coil shall be constructed of aluminum fins mechanically bonded to seamless copper tubes, which are cleaned, dehydrated, and sealed.
- 4. Controls and Safeties: Operating controls and safeties shall be factory selected, assembled, and tested. The minimum control functions shall include the following:
 - a. Time delay restart to prevent compressor reverse rotation on single-phase scroll compressors.
 - b. Automatic restart on power failure.
 - c. Safety lockout if any outdoor unit safety is open.
 - d. High pressure and liquid line low-pressure switches.
 - e. Automatic outdoor fan motor protection.
 - f. Start capacitor and relay (single-phase units without scroll compressors).
 - g. Compressor motor current and temperature overload protection.
 - h. High pressure relief.
 - i. Outdoor fan failure protection.
 - j. All power and control wiring must be installed per NEC and all local building codes.
 - k. High and low voltage terminal block connections.

5. Unit shall be variable speed inverter driven compressor. Unit shall be provided with seacoast protection, anti-corrosion treatment in accordance with ASTM B117.
6. Equipment shall meet or exceed minimum Energy Code Efficiency Requirements.

B. Fan Coil Units

1. Indoor, ceiling cassette, direct-expansion fan coil to be matched with the commercial condensing or heat pump units.
2. Unit shall be complete with cooling/heating (heat pump systems only) coil, fan, fan motor, piping connectors, electrical controls, microprocessor control system, and integral temperature sensing. Unit shall be furnished with mounting hardware.
3. Fan shall be tangential direct-drive type.
4. Coil shall be copper tube with aluminum fins and galvanized steel tube sheets. Fins shall be bonded to the tubes by mechanical expansion. A drip pan under the coil shall have a drain connection for hose attachment to remove condensate. Condensate pan shall have internal trap and auxiliary drip pan under coil header.
5. Motors shall be open drip-proof, permanently lubricated ball bearing with inherent overload protection. Fan motors shall be 3-speed.
6. Controls shall control space temperature, determine optimum fan speed, and run self diagnostics. The temperature control range shall be from 64°F to 84°F. The unit shall have the following functions as a minimum:
 - a. An automatic restart after power failure at the same operating conditions as at failure.
 - b. A timer function to provide a minimum 24-hour timer cycle for system with automatic Start/Stop.
 - c. Temperature-sensing controls shall sense return-air temperature. Indoor-air high discharge temperature shutdown shall be provided.
 - d. Indoor coil freeze protection.
 - e. Wireless infrared remote control to enter set points and operating conditions.
 - f. Auto Stop features shall have integral setback control.
 - g. Automatic air sweep control to provide on or off activation of air sweep louvers.
 - h. Dehumidification mode shall provide increased latent removal capability by modulating fan speed and set point temperature.
 - i. Fan only operation shall provide room air circulation when no cooling is required.
 - j. Diagnostics shall provide continuous checks of unit operation and warn of possible malfunctions. Error messages shall be displayed at the unit and at the remote controller.

- k. Fan speed control shall be user-selectable; high, medium, low or microprocessor automatic operation during all operating modes.
- l. A time delay shall prevent compressor restart in less than 3 minutes.
- 7. Unit shall have filter rack with factory supplied cleanable filters.

2.03 CORROSION PROTECTION

- A. Special protection for cabinets is not required for equipment that has a zinc coating conforming to ASTM A 386 or a duplex coating of zinc and paint. Equipment items shall be protected by the manufacturer with a corrosion-inhibiting coating or paint system that have been proven capable of satisfactorily withstanding the following tests: Test method shall be ASTM B117. Period of test shall be 3,000 hours for equipment intended for installation indoors; test period shall be 10,000 hours for equipment intended for installation outdoors or which will be otherwise subjected to marine atmosphere. Each specimen shall have a standard scratch as defined in ASTM D 1654.
- B. Finned Tube Coils: Finned tube coils shall be protected with "Blygold Polual", or "Thermoguard Fin Guard Silver" a polyurethane based metal impregnated coating.
 - 1. Coating thickness and application shall be applied in strict accordance with the coating manufacturer's recommendation.
 - 2. The coating shall be performed by a qualified and experienced factory certified applicator such as International A/C Coatings, Honolulu, Hawaii, Thermoguard Pacific, Inc., or an approved applicator.
- C. Cabinet and Exterior Surfaces: Unit cabinet shall be coated with Ameron PSX 700 Engineered Siloxane or "Thermoguard Casing Guard". Metal preparation shall provide a surface profile that shall include degreasing and etching.
 - 1. The coating shall be applied to all interior and exterior surfaces. Coating thickness and application shall be applied in strict accordance with coating manufacturer's recommendations.
 - 2. After the coating has totally cured, the equipment shall be assembled using care not to damage the coating during assembly. Fasteners shall be stainless steel with bonderized rubber washer attached. Any touch up required shall be performed in accordance with the manufacturer's recommendations.
- D. The coating shall be performed by a qualified and experienced factory certified applicator such as International A/C Coatings, Honolulu, Hawaii, Thermoguard Pacific, Inc. or an approved applicator.

2.04 AIR HANDLING UNITS

- A. Furnish central station air handling units of the type, size and capacity shown on the equipment schedules. Unit performance shall be certified in accordance with Air Conditioning and Refrigeration Institute (ARI) Standard 430 for central station air handling units. Units shall be as manufactured by Carrier, Dunham-Bush, Trane, York, McQuay, or approved equal meeting the requirements of this specifications.

February 27, 2026

- B. Units shall be of the horizontal or vertical type as shown on the drawings and shall consist of a fan and coil section with factory installed coil and filter section.
- C. UV-C Protection: Wiring which does not have UV-resistant insulation shall be protected from UV-C energy. Wiring may be shielded with foil tape, metal conduit, or sheet metal. Access doors shall be provided with door interlock switches to turn off power to UV-C lamps when door is opened. Warning signs shall be provided for each access door from which the UV-C lamp would be visible. Provide extra warning decals for the UV-C lamp disconnect and the AHU disconnect/starter.
- D. Unit Casing:
 - 1. Component modules shall be constructed of sectionalized formed panels, rigidly reinforced with external hat channels. Casing panels shall be removable for easy access to the unit. Panels shall be mill galvanized steel.
 - 2. On all sections requiring access doors, the handles shall be safety latch type.
 - 3. All units installed outdoors shall have gasketed joints between panels, and where indicated on the drawings shall be mounted on a 14" high prefabricated curb, NRCA approved, complete with gasketing. Curb to be supplied by the air handling unit manufacturer.
- E. Insulation:
 - 1. Coil section, fan section and accessory sections of unit shall be insulated with 1" thick 3 lb. density neoprene coated fiberglass.
 - 2. Insulation shall be secured to casing with water proof adhesive and permanent mechanical fasteners.
 - 3. Insulation shall meet NFPA-90A flame spread and smoke generation requirements.
- F. Drain Pan: The condensate drain pans shall have double wall construction with threaded drain connections on both ends. Condensate drain pan shall be insulated with 0.6" thick isocyanurate foam faced with an additional aluminum foil vapor barrier and cemented between the steel outer pan and the heavy gauge steel inner pan. Inner pan shall be coated with corrosion resistant elastomeric based material. Insulation adhesive and inner coating to comply with NFPA-90A flame spread and smoke generation requirements.
- G. Fan Section:
 - 1. Fan sections shall be constructed of galvanized steel and shall have a formed channel base for integral mounting of fan, motor and casing panels. Fan scroll, wheel, shaft, and bearings shall be mounted on a structural steel frame rigidly secured to the channel base.
 - 2. Each unit shall have one fan wheel and scroll only. Fans shall be double width, double inlet type, with forward curved blades or backward curved airfoil section blades as indicated on the equipment schedule. Forward curved wheels shall be bonderized steel painted with baked on enamel, or with galvanized steel. Airfoil wheels shall be steel painted with zinc chromate primer and an enamel finish coat.
 - 3. Fan shafts shall be solid steel, turned, ground and polished.

February 27, 2026

4. Fan wheels shall be keyed to the shaft and shall be designed for continuous operation at the maximum rated fan speed and motor horsepower. Fan wheels and shafts shall be selected to operate at least 25% below the first critical speed, and shall be statically and dynamically balanced as an assembly. After final assembly, the entire unit shall be given a final vibration test at the factory.
5. Fan bearings shall be self aligning, pillow block regreasable ball type selected for an average L10 life of 200,000 hours at design operating conditions, per ANSI Code B 3.15.
6. Fan motors shall be factory mounted inside the fan section casing, on slide rails having 2 adjusting screws. Motors shall be open drip proof type and 1750 RPM. Motor efficiency shall be as specified in paragraph "MOTORS".
7. Fan drives shall be factory mounted with final alignment and belt adjustment to be made by the Contractor after installation. Belt drives shall be variable pitch type up to and including 25 hp, fixed pitch type above 25 hp.

H. Coil Section:

1. Coil Sections shall have heavy duty coil tracks extending the full width of the unit to provide slip in, slip out coils for ease of service and maintenance.
2. All coils shall be tested at 350 PSIG air pressure with coil submerged in water.
3. Coils shall be plate fin type for use in factory fabricated units and shall be of the cartridge type, removable from the coil connection side of the casing and supported in tracks over the entire length of the coil. Coil performance shall be certified in accordance with Air Conditioning and Refrigeration Institute (ARI) Standard 410-72.
4. Chilled water coils shall be aluminum plate fins with belled collars and bonded to 5/8" minimum OD copper tubes by mechanical expansion. Coils shall have galvanized steel casings and steel headers with threaded connections. Working pressure shall be 300 psig at 200F°. Coils shall be drainable and have trapping circuits. No turbulence promoting devices will be permitted inside the tubes. Headers shall have drain and vent connections.
5. Direct expansion coils shall be aluminum plate fins with belled collars and bonded to 5/8" OD copper tubes by mechanical expansion. Coils shall be provided with pressure type brass distributors with solder type connections and shall have a minimum of 2 distributors. Coils for full face active or face split operation shall have intertwined circuits for equal loading on each circuit. Suction and discharge connections shall be on the same end. After testing, coils shall be dehydrated and charged with dry air.
 - a. Coils shall be designed and tested in accordance with American National Standard Safety Code for Mechanical Refrigeration (ANSI B9.1).

I. Filter Section:

1. Filter section shall be supplied by the air handling unit manufacturer, with the same casing construction as before specified for other unit sections. The

type of filters to be housed within the filter section shall be of the type and efficiency indicated on the equipment schedule. Different types of filter sections shall be supplied as specified in the following paragraphs.

2. Low velocity filter sections shall be capable of receiving 2" thick filters of standard sizes. Section to be complete with side access slide rails and hinged access doors on both sides. Low velocity filter section shall be arranged in horizontal V formation.

J. Mixing Box:

1. Mixing boxes shall have parallel blade, inter-connected outside air and return air dampers. Damper blades shall have parallel bends for stiffness and shall be welded to 1/2" diameter steel rods rotating in nylon bushings and mounted in rigid galvanized steel damper frames. Dampers shall be sectionalized to limit blade length to not more than 50" in order to prevent excess blade warping and assure tight closure.
2. Rated low leakage dampers having a leakage rate not to exceed 2% of air quantity calculated at 2000 FPM face velocity, at 4.0" w.g. pressure difference shall be furnished. Damper blades shall be gasketed and perimeter sealing strips shall be provided.
3. Mixing boxes may be factory or field fabricated.

- K. Face and Bypass Section: Face and bypass sections shall have opposed acting damper blades. Damper blades shall be brake formed at the edges and be mechanically secured to 1/2" steel rods, rotating in nylon bushings and mounted in a rigid galvanized steel damper frame. Dampers shall be sectionalized to limit blade length to not more than 50" in order to prevent excess blade warping and assure tight closure.

2.05 HIGH VELOCITY TERMINAL UNITS

- A. Terminal units designated shall be of capacity and sizes shown on drawings or terminal unit schedule. Units shall have factory catalog performance ratings and shall be oversized as required to conform to C.F.M., Static Pressure, discharge and radiated sound power levels designated. Static pressure drop and sound power levels as scheduled on drawings shall not be exceeded. Units shall be of the physical dimensions shown on the drawings and fit the space provided.
- B. Cabinets shall be constructed of not lighter than 22 gauge, zinc-coated steel. Internal surfaces shall be acoustically and thermally insulated with 1-inch glass fiber material surface treated to prevent erosion and having U.L. approval meeting NBFU and NFPA 90A. Width of units shall not exceed 27 inches.
- C. Air volume damper shall be extruded aluminum and be constructed to prevent air leakage in excess of 2% of rated air quantity at 1" inlet static pressures.
- D. Automatic damper actuator/controllers shall be factory installed and thoroughly tested for proper performance. Damper actuator/controllers shall be 24-volt solid state electronic proportioning type with integral limit switches to de-energize the actuator at full open, full closed and when the thermostat is satisfied. The electronic damper actuator shall consist of a reversible electric motor developing a minimum of 40 pounds thrust. All controllers shall be connected (in a daisy-chain wiring circuit), to a computer-based energy monitoring and control system. Provide

February 27, 2026

under this contract electronic wall thermostats, 24-volt transformers, 120-volt wiring and conduit from dedicated circuit breakers in electric distribution panel to 24-volt transformers. Direct digital electronic controller shall be capable of the following information and command exchange with the EMCS:

1. Information Transmitted
 - a. Supply Air CFM
 - b. Supply Air Temperature
 - c. Space Temperature
 - d. Maximum CFM Set Point
 - e. Minimum CFM Set Point
 - f. Cooling Set Point
 2. Commands Accepted
 - a. Cooling Set Point (70°F. to 85°F.)
 - b. Maximum Velocity Set Point (0 FPM to 2,000 FPM)
 - c. Minimum Velocity Set Point (400 FPM to 3,000 FPM)
- E. Thermostats shall be furnished with clear plastic vandal proof covers with lock.
- F. Acoustical Performance: The self noise of the high velocity terminal unit including both noise radiated by the box panels and throughout the discharge opening shall not exceed the sound power levels tabulated on schedule at the maximum design values of CFM and inlet static pressure indicated. Sound rating shall be ARI Certified in accordance with Standard 880.
- G. Test Conditions:
1. Applicable Standards: Performance of units shall be in accordance with ASHRAE Standard 36-72 and Air Diffusion Council Test Code No. 1062R4.
 2. Radiated Noise: In order to evaluate the noise radiated by the box panels, the high velocity terminal unit shall be installed in a reverberant room with 4 feet of high pressure ductwork preceding the unit and with sufficient length of low pressure ductwork to duct the discharge air out of the room. The duct gauge, size and construction shall be similar to that shown on the drawings.
 3. Discharge Noise: In order to evaluate the noise emitted from the high velocity terminal unit discharge opening, the unit and a short length of lined ductwork shall be installed outside the reverberant room, with the duct terminating at the face of the chamber.
 4. The Manufacturer shall furnish all required test information and data to the Architect for review, prior to his units being accepted as suitable for installation.
- H. Terminal units shall be manufactured by Krueger, Carrier or approved equal.

2.06 FANS

- A. Fans shall be sound and air tested and rated in accordance with the standards of the Air Movement and Control Association, Inc. Fans shall be directly connected

to the motor shaft or indirectly connected to the motor by means of a V-belt drive as noted on equipment schedule. Where V-belt drives are used, motor sheaves shall be adjustable to provide not less than 20 percent speed variation. Sheaves shall be selected to drive the fan at such speed as to produce the specified capacity at field static pressure when set at the approximate midpoint of the sheave adjustment. Motors for V-belt drives shall be provided with adjustable rails or bases. Fans shall be provided with personnel screens or guards on both suction and supply ends except where ducts or dampers are connected to the fan. Provide aluminum bird screen at discharge of aluminum fans and stainless steel bird screens for steel fans. Fans and motors shall be provided with vibration isolation supports or mountings. Each fan shall be selected to produce the capacity required at the fan total pressure indicated. Standard AMCA arrangement, rotation and discharge shall be as indicated on the drawing. Motor efficiency shall be as specified in paragraph "MOTORS". Fans shall be manufactured by Penn, Greenheck, ACME, Cook, Carnes or approved equal. When sound criteria is indicated on drawings, equipment shall be AMCA certified for Air and Sound. Otherwise equipment shall be AMCA certified for Air only.

1. Utility Centrifugal Fans:

- a. Utility Centrifugal Fume Exhaust Fan shall be constructed with coated steel frame, scroll and stack, bolted frame. Impeller wheels shall have backward inclined centrifugal wheel. Impeller wheels shall be rigidly constructed, accurately balanced both statically and dynamically, and free from objectionable vibration or noise. Fan shall have 316L stainless steel 10 feet no loss stack, corrosion resistant fasteners. Bearings shall have self-aligning, ball bearing in pillow block housing, 80,000 bearing life.
- b. Utility Exhaust Fan shall be single-width centrifugal fan. Fan housing shall be constructed Class II and under feature Perma-Lock. Fan shall have support angles with mounting holes, adjustable motor plate, corrosion resistant fasteners.

2. Inline Fans: Supply or exhaust fans shall be belt driven inline type. The square shaped fan housing shall be of heavy gauge formed steel. One of the sides shall be hinged and shall support the entire drive assembly and wheel allowing the assembly to swing out for cleaning, inspection, or service without dismantling the unit in any way. The motor shall be mounted on the hinged side exterior isolated from the airstream. The belt and pillow block ball bearing shall be protected from the airstream by an enclosure. The shaft shall be keyed to both the wheel and pulley.

- a. The fan inlet shall be a spun venturi throat overlapped by a backward curved centrifugal wheel with spun cone for maximum performance.

3. Ceiling Fan:

- a. Ceiling Exhaust: The ceiling fan shall be Greenheck. The fan housing shall be constructed of phosphatized steel with an oven baked enamel finish. The housing interior shall be acoustically lined with 1/2 inch thick insulation. The discharge outlet shall be adaptable to horizontal or vertical positions. The terminal box shall be internally mounted for

motor hook-up. The motor shall be mounted on resilient elastic grommets. The fan shall have a forward curved centrifugal wheel.

2.07 ROOF CAPS

- A. Relief air and outside air inlet hoods shall be heavy gauge aluminum construction with hinged hoods designed for intake or exhaust. All vertical seams shall be continuously welded with lock formed seams on hood ends. Hoods shall be stressed and sloped for drainage. Provide aluminum expanded metal bird screen with 85 percent free area.

2.08 MOTORS

- A. All motors one horsepower and larger shall be energy efficient type. Efficiency rating shall be in accordance with NEMA Premium.
- B. Motors shall have a 1.15 service factor.
- C. Motors to be used with variable speed drives shall be provided with phase isolation, Class F insulation and a winding thermostat that will detect any motor overheat conditions.
- D. Motor shall be designed to operate at full capacity with a voltage variation of plus or minus 10 percent of the motor voltage rating. Motor size shall be sufficient for the duty to be performed and shall not exceed its full load nameplate current rating when driven equipment is operated at specified capacity under the most severe conditions likely to be encountered. When motor size provided differs from the size indicated or specified, the Contractor shall make the necessary adjustments to the wiring, disconnect devices, and branch circuit protection to accommodate the equipment actually provided, at no cost to the Owner.
- E. Provide a motor starter for each motor.

2.09 VARIABLE SPEED DRIVE

- A. Furnish complete variable frequency VFDs as specified herein for the fans and pumps designated on the drawing schedules to be variable speed. All standard and optional features shall be included within the VFD enclosure, unless otherwise specified. VFD shall be housed in a metal NEMA 1 enclosure, or other NEMA type according to the installation and operating conditions at the job site. The VFD's UL listing shall allow mounting in plenum or other air handling compartments. If a NEMA 12 enclosure is required for the plenum rating, the manufacturer must supply a NEMA 12 rated VFD.
- B. The VFD shall convert incoming fixed frequency three-phase AC power into a variable frequency and voltage for controlling the speed of three-phase AC motors. The motor current shall closely approximate a sine wave. Motor voltage shall be varied with frequency to maintain desired motor magnetization current suitable for centrifugal pump and fan control and to eliminate the need for motor derating.
- C. With the motor's rated voltage applied to the VFD input, the VFD shall allow the motor to produce full rated power at rated amps, RMS fundamental volts, and speed without using the motor's service factor. VFDs utilizing sine weighted/coded modulation (with or without 3rd harmonic injection) must provide data verifying that

the motors will not draw more than full load current during full load and full speed operation.

- D. The VFD shall include an input full-wave bridge rectifier and maintain a fundamental power factor near unity regardless of speed or load.
- E. The VFD and options shall be tested to ANSI/UL Standard 508. The complete VFD, including all specified options, shall be assembled by the manufacturer, which shall be UL 508 certified for the building and assembly of option panels. Assembly of the option panels by a third-party panel shop is not acceptable. The appropriate UL stickers shall be applied to both the VFD and option panel, in the case where these are not contained in one panel. When these VFDs are to be located in Canada, CSA or C-UL certifications shall apply. Both VFD and option panel shall be manufactured in ISO 9001 certified facilities.
- F. The VFD shall have a DC link reactor on both the positive and negative rails of the DC bus to minimize power line harmonics. VFDs without a DC link reactor shall provide a minimum 3% impedance line reactor.
- G. The VFD's full load amp rating shall meet or exceed NEC Table 430-150. The VFD shall be able to provide full rated output current continuously, 110% of rated current for 60 seconds and 160% of rated current for up to 0.5 second while starting.
- H. The VFD shall be able to provide full torque at any selected frequency from 28 Hz to base speed to allow driving direct drive fans without derating.
- I. An automatic energy optimization selection feature shall be provided standard in the VFD. This feature shall automatically and continually monitor the motor's speed and load and adjust the applied voltage to maximize energy savings and provide up to an additional 3% to 10% energy savings.
- J. Input and output power circuit switching shall be able to be accomplished without interlocks or damage to the VFD. Switching rate may be up to 1 time per minute on the input and unlimited on the output.
- K. An automatic motor adaptation test algorithm shall measure motor stator resistance and reactance to optimize performance and efficiency. It shall not be necessary to run the motor or decouple the motor from the load to run the test.
- L. Galvanic and/or optical isolation shall be provided between the VFD's power circuitry and control circuitry to ensure operator safety and to protect connected electronic control equipment from damage caused by voltage spikes, current surges, and ground loop currents. VFDs not including either galvanic or optical isolation on both analog I/O and discrete I/O shall include additional isolation modules.
- M. VFD shall minimize the audible motor noise through the use of an adjustable carrier frequency. The carrier frequency shall be automatically adjusted to optimize motor and VFD efficiencies while reducing motor noise.
- N. Protective Features:
 - 1. Class 20 I2t electronic motor overload protection for single motor applications and thermal-mechanical overloads for multiple motor applications shall be provided.

February 27, 2026

2. Protection against input transients, loss of AC line phase, output short circuit, output ground fault, overvoltage, undervoltage, VFD overtemperature and motor overtemperature. The VFD shall display all faults in plain English. Codes are not acceptable.
3. Protect VFD from sustained power or phase loss. The VFD shall provide full rated output with an input voltage as low as 90% of the nominal. The VFD will continue to operate with reduced output with an input voltage as low as 164 V AC for 208/230 volt units, and 313 V AC for 460 volt units.
4. The VFD shall incorporate a motor preheat circuit to keep the motor warm and prevent condensation build up in the stator.
5. VFD package shall include semi-conductor rated input fuses to protect power components.
6. To prevent breakdown of the motor winding insulation, the VFD shall be designed to comply with IEC Part 34-17. Otherwise the VFD manufacturer must ensure that inverter rated motors are supplied.
7. VFD shall include a "signal loss detection" circuit to sense the loss of an analog input signal such as 4 to 20 mA or 2 to 10 V DC, and shall be programmable to react as desired in such an instance.
8. VFD shall function normally when the keypad is removed while the VFD is running and continue to follow remote commands. No warnings or alarms shall be issued as a result of removing the keypad.
9. VFD shall catch a rotating motor operating forward or reverse up to full speed.
10. VFD shall be rated for 100,000 amp interrupting capacity (AIC).
11. VFD shall include current sensors on all three output phases to detect and report phase loss to the motor. The VFD will identify which of the output phases is low or lost.
12. Drive shall continue to operate without faulting until input voltage reaches 300 V AC on 208/230 volt VFDs, and 539 V AC on 460 volt VFDs.

O. Interface Features:

1. Hand/Start, Off/Stop and Auto/Start selector switches shall be provided to start and stop the drive and determine the speed reference.
2. The VFD shall be able to be programmed to provide a 24 V DC output signal to indicate that the VFD is in Auto/Remote mode.
3. The VFD shall provide digital manual speed control. Potentiometers are not acceptable.
4. Lockable, alphanumeric backlit display keypad can be remotely mounted up to 10 feet away using standard 9-pin cable.
5. The keypads for all sizes shall be identical and interchangeable.
6. To set up multiple VFDs, it shall be possible to upload all setup parameters to the VFD's keypad, place that keypad on all other VFDs in turn and download the setup parameters to each VFD. To facilitate setting up VFDs

of various sizes, it shall be possible to download from the keypad only size independent parameters.

7. Display shall be programmable to display in 9 languages including English, Spanish and French.
8. The display shall have four lines, with 20 characters on three lines and eight large characters on one line.
9. A red FAULT light, a yellow WARNING light and a green POWER-ON light shall be provided. These indications shall be visible both on the keypad and on the drive when the keypad is removed.
10. A quick setup menu with factory preset typical HVAC parameters shall be provided on the VFD eliminating the need for macros.
11. The VFD shall include a standard RS 485 serial communications port and be connected at a future date to a Johnson Controls N2 Metasys or Siemens FLN system at no additional cost to the owner. The connection shall be software selectable by the user.
12. As a minimum, the following points shall be controlled and/or accessible:
 - a. VFD Start/Stop
 - b. Speed reference
 - c. Fault diagnostics
 - d. Meter points
 - 1) Motor power in HP
 - 2) Motor power in kW
 - 3) Motor kW-hr
 - 4) Motor current
 - 5) Motor voltage
 - 6) Hours run
 - 7) Feedback signal #1
 - 8) Feedback signal #2
 - 9) DC link voltage
 - 10) Thermal load on motor
 - 11) Thermal load on VFD
 - 12) Heatsink temperature
13. Four additional Form C 230 volt programmable relays shall be available for factory or field installation within the VFD.
14. LonWorks communication shall be available for factory or field installation within the VFD.
15. Two set-point control interface (PID control) shall be standard in the unit. VFD shall be able to look at two feedback signals, compare with two set-points and make various process control decisions.

16. Floating point control interface shall be provided to increase/decrease speed in response to switch closures.
17. Four simultaneous displays shall be available. They shall include frequency or speed, run time, output amps and output power. VFDs unable to show these four displays simultaneously shall provide panel meters.
18. Sleep mode shall be provided to automatically stop the VFD when its speed drops below set "sleep" level for a specified time. The VFD shall automatically restart when the speed command exceeds set "wake" level.
19. The sleep mode shall be functional in both follower mode and PID mode.
20. Run permissive circuit shall be provided to accept a "system ready" signal to ensure that the VFD does not start until dampers or other auxiliary equipment are in the proper state for VFD operation. The run permissive circuit shall also be capable of sending an output signal as a start command to actuate external equipment before allowing the VFD to start.
21. The following displays shall be accessible from the control panel in actual units: Reference Signal Value in actual units, Output Frequency in Hz or percent, Output Amps, Motor HP, Motor kW, kWhr, Output Voltage, DC Bus Voltage, VFD Temperature in degrees, and Motor Speed in engineering units per application (in percent speed, GPM, CFM, etc.). VFD will read out the selected engineering unit either in a linear, square or cubed relationship to output frequency as appropriate to the unit chosen.
22. The display shall be programmed to read in inches of water column (in-wg) for an air handler application, pressure per square inch (psi) for a pump application, and temperature (°F) for a cooling tower application.
23. VFD shall be able to be programmed to sense the loss of load and signal a no load/broken belt warning or fault.
24. If the temperature of the VFD's heat sink rises to 80°C, the VFD shall automatically reduce its carrier frequency to reduce the heat sink temperature. If the temperature of the heat sink continues to rise the VFD shall automatically reduce its output frequency to the motor. As the VFD's heat sink temperature returns to normal, the VFD shall automatically increase the output frequency to the motor and return the carrier frequency to its normal switching speed.
25. The VFD shall have temperature controlled cooling fans for quiet operation and minimized losses.
26. The VFD shall store in memory the last 10 faults and record all operational data.
27. Eight programmable digital inputs shall be provided for interfacing with the systems control and safety interlock circuitry.
28. Two programmable relay outputs, one Form C 240 V AC, one Form A 30 V AC, shall be provided for remote indication of VFD status.
29. Three programmable analog outputs shall be provided and shall accept a direct-or-reverse acting signal. Analog reference inputs accepted shall

February 27, 2026

include two voltage (0 to 10 V DC, 2 to 10 V DC) and one current (0 to 20 mA, 4 to 20 mA) input.

30. Two programmable 0 to 20 mA analog outputs shall be provided for indication of VFD status. These outputs shall be programmable for output speed, frequency, current and power. They shall also be programmable to provide a selected 24 V DC status indication.
31. Under fire mode conditions the VFD shall automatically default to a preset speed.

P. Adjustments:

1. VFD shall have an adjustable carrier frequency in steps of not less than 0.1 kHz to allow tuning the VFD to the motor.
2. Sixteen preset speeds shall be provided.
3. Four acceleration and four deceleration ramps shall be provided. Acceleration and deceleration time shall be adjustable over the range from 0 to 3,600 seconds to base speed. The shape of these curves shall be automatically contoured to ensure no-trip acceleration and deceleration.
4. Four current limit settings shall be provided.
5. If the VFD trips on one of the following conditions, the VFD shall be programmable for automatic or manual reset: undervoltage, overvoltage, current limit, and inverter overload.
6. The number of restart attempts shall be selectable from 0 through 20 or infinitely and the time between attempts shall be adjustable from 0 through 600 seconds.
7. An automatic "on delay" shall be selected from 0 to 120 seconds.

Q. Bypass:

1. Provide a manual 3-contactor bypass consisting of a door interlocked main fused disconnect padlockable in the off position, a built-in motor starter and a four position DRIVE/OFF/BYPASS/TEST switch controlling three contactors. In the DRIVE position, the motor is operated at an adjustable speed from the VFD. In the OFF position, the motor and VFD are disconnected. In the BYPASS position, the motor is operated at full speed from the AC power line and power is disconnected from the VFD so that service can be performed. In the TEST position, the motor is operated at full speed from the AC line power while power is applied to the input of the VFD. This allows the VFD to be given an operational test while continuing to run the motor at full speed in bypass. In case of an external safety fault, a customer supplied normally closed dry contact shall be able to stop the motor whether in DRIVE or BYPASS mode
2. Service personnel shall be able to defeat the main power disconnect and open the bypass enclosure without disconnecting power. This shall be accomplished through the use of a specially designed tool and mechanism while meeting all local and national code requirements for safety.

R. Service Conditions:

February 27, 2026

1. Ambient temperature, -10 to 40°C (14 to 104°F).
2. 0 to 95% relative humidity, non-condensing.
3. Elevation to 3,300 feet without derating.
4. AC line voltage variation, -10 to +10% of nominal with full output.
5. No side clearance shall be required for cooling of any units. All power and control wiring shall be done from the bottom.

S. Quality Assurance:

1. To ensure quality and minimize infantile failures at the jobsite, the complete VFD shall be tested by the manufacturer. The VFD shall operate a dynamometer at full load and speed shall be cycled during the test.
2. All optional features shall be functionally tested at the factory for proper operation.

T. Submittals:

1. Submit manufacturer's performance data including dimensional drawings, power circuit diagrams, installation and maintenance manuals, warranty description, VFD's FLA rating, certification agency file numbers and catalog information.
2. The specification lists the minimum VFD performance requirements for this project. Each supplier shall list any exceptions to the specification. If no departures from the specification are identified, the supplier shall be bound by the specification.
3. Harmonic filtering. The seller shall, with the aid of the buyer's electrical power single line diagram, providing the data required by IEEE-519, perform an analysis to initially demonstrate the supplied equipment will meet the IEEE standards after installation. If, as a result of the analysis, it is determined that additional filter equipment is required in the bid. A harmonic analysis shall be submitted with the approval drawings to verify compliance with the latest version of IEEE-519 voltage and current distortion limits as shown in table 10.2 and 10.3 at the point of common coupling (PCC). The PCC shall be defined as the consumer-utility interface or primary side of the main distribution transformer.

U. Start-up Service

1. The manufacturer shall provide start-up commissioning of the VFD and its optional circuits by a factory certified service technician who is experienced in start-up and repair services. Sales personnel and other agents who are not factory certified shall not be acceptable as commissioning agents. Start-up services shall include checking for verification of proper operation and installation for the VFD, its options and its interface wiring to the building automation system.
2. Warranty: The VFD shall be warranted by the manufacturer for a period of 36 months from date of shipment. The warranty shall include parts, labor, travel costs and living expenses incurred by the manufacturer to provide factory authorized on-site service. The warranty shall be provided by the VFD manufacturer.

V. Examination

1. Contractor to verify that job site conditions for installation meet factory recommended and code-required conditions for VFD installation prior to start-up, including clearance spacing, temperature, contamination, dust, and moisture of the environment. Separate conduit installation of the motor wiring, power wiring, and control wiring, and installation per the manufacturer's recommendations shall be verified.
2. The VFD is to be covered and protected from installation dust and contamination until the environment is cleaned and ready for operation. The VFD shall not be operated while the unit is covered.

2.10 DISPOSABLE FILTER (FOR FAN COIL UNITS AND AIR HANDLING UNITS)

A. Air filters shall be as scheduled, medium efficiency, pleated, disposable type. Each filter shall consist of a non-woven cotton fabric media, media support grid and enclosing frame. The filter shall be listed by Underwriters' Laboratories as Class II.

1. Filter Media: Filter media shall be of the non-woven cotton fabric type. The filter media shall have an average efficiency of 25-30% on ASHRAE Test Standard 52.76. It shall have an average arrestance of 90-92% in accordance with that test standard.
2. 4-Inch: The effective filter media shall be not less than 7.0 square feet of media per 1.0 square foot of filter face area and shall contain not less than 11 pleats per linear foot. Initial resistance at 600 fpm approach velocity shall not exceed 0.35" w.g.
3. 2-Inch: The effective filter media shall be not less than 4.6 square feet of media per 1.0 square foot of filter face area and shall contain not less than 15 pleats per linear foot. Initial resistance at 500 fpm approach velocity shall not exceed 0.28" w.g.
4. Media Support Grid: The media support shall be a welded wire grid with an effective open area of not less than 96%. The welded wire grid shall be bonded to the filter media to eliminate the possibility of media oscillation and media pull-away. The media support grid shall be formed in such a manner that it effects a radial pleat design, allowing total use of filter media.
5. Enclosing Frame: The enclosing frame shall be constructed of a rigid, heavy duty, high wet strength beverage board, with diagonal support members bonded to the air entering and air exit side of each pleat, to ensure pleat stability. The inside periphery of the enclosing frame shall be bonded to the filter pack, thus, eliminating the possibility of air bypass.
6. Holding Frame: Holding frames shall be Farr Type 8, factory fabricated of 16 gauge galvanized steel and shall be equipped with gaskets and four spring type positive sealing fasteners. Fasteners shall be capable of being attached or removed without the use of tools.
7. Spare Filters: A set of filters shall be supplied for use during the testing and balancing period. A new set of filters shall be installed after testing and balancing, and after system operation for an aggregate total of 24-hours.

2.11 VIBRATION ISOLATORS

- A. All isolators shall be hot dipped galvanized with galvanized or stainless steel fasteners. Isolators shall be as manufactured by Mason, Vibrex, Vibro-Acoustics, Korfund, California Dynamics Corporation, M.W. Sausse & Co., or approved equal.
1. Neoprene Isolators: Double deflection neoprene mountings shall have a minimum static deflection of 0.35". All metal surfaces shall be neoprene covered to avoid corrosion and have friction pads both top and bottom so they need not be bolted to the floor. Bolt holes shall be provided for these areas where bolting is required. On equipment such as small vent sets and close coupled pumps, steel rails shall be used above the mountings to compensate for the overhang. Mountings shall be type ND or rails type DNR as manufactured by Mason Industries, Inc.
 2. Spring Mount Restrained Isolator: Equipment with operating weight different from the installed weight such as chillers, boilers, etc. and equipment exposed to the wind such as cooling towers shall be mounted on spring mountings above except a housing shall be used that includes vertical limit stops to prevent spring extension when weight is removed. The installed and operating heights shall be the same. A minimum clearance of 1/2" shall be maintained around restraining bolts and between the housing and the spring so as not to interfere with the spring action. Limit stops shall be out of contact during normal operations. Mountings used outdoors shall be hot dipped galvanized. Isolators shall have a 2" minimum static deflection unless otherwise indicated. Mountings shall be SLR as manufactured by Mason Industries, Inc.
 3. Spring/Neoprene Hanger Isolator: Vibration hangers shall contain a steel spring and 0.3" deflection neoprene element in series. The neoprene element shall be molded with a rod isolation bushing that passes through the hanger box. Spring diameters and hanger box lower hole sizes shall be large enough to permit the hanger rod to swing through a 30° arc before contacting the hole and short circuiting the spring. Springs shall have a minimum additional travel to solid equal to 50% of the rated deflection. Submittals shall include a scale drawing of the hanger showing the 30° capability. Isolators shall have a 2" minimum static deflection unless otherwise indicated. Hangers shall be type 30N as manufactured by Mason Industries, Inc.
 4. Spring Hanger Isolator: Vibration hangers shall contain a steel spring located in a neoprene cup manufactured with a grommet to prevent short circuiting of the hanger rod. The cup shall contain a steel washer designed to properly distribute the load on the neoprene and prevent its extrusion. Spring diameters and hanger box lower hole sizes shall be large enough to permit the hanger rod to swing through a 30° arc before contacting the hole and short circuiting the spring. Springs shall have a minimum additional travel to solid equal to 50% of the rated deflection. Hangers shall be provided with an eye bolt on the spring end and provision to attach the housing to the flat iron duct straps. Submittals shall include a scale drawing of the hanger showing the 30° capability. Isolator shall have a 2" minimum static deflection unless otherwise indicated. Hangers shall be type RMXA as manufactured by M.W. Sausse & Co.

5. Neoprene Pad: Vibration isolator manufacturer shall furnish waffle neoprene pad, 3/4" thick. When thicknesses of greater than 3/4" are indicated on drawing, multiple layers shall be used with 18 gauge 304 stainless steel sheets between layers. Pads shall be Super W as manufactured by Mason Industries or approved equal.
6. Flexible Stainless Steel Pipe Connectors: Flexible stainless steel hose shall have stainless steel braid and carbon steel fittings. Sizes 2-1/2" and larger shall be flanged. Smaller sizes shall have male nipples. Lengths shall be as tabulated:

FLANGED		MALE NIPPLES	
3 x 14	10 x 26	1/2 x 9	1-1/2 x 13
4 x 15	12 x 28	3/4 x 10	2 x 14
5 x 19	14 x 30	1 x 11	2-1/2 x 18
6 x 20	16 x 32	1-1/4 x 12	
8 x 22			

- a. Hoses shall be installed on the equipment side of the shut-off valves horizontally and parallel to the equipment shafts wherever possible. Hoses shall be type BSS as manufactured by Mason Industries, Inc.
7. Flexible Duct Connectors: Flexible connections of Dupont Hypalon-coated 26-oz. glass fabric to prevent the transmission of vibration through the ducts, shall be installed on both the supply and return sides of all fans and ventilating units, approximately where shown on drawings. Cloth used for flexible connections shall be UL approved, of heat resistant to 300°F, and shall be properly fitted to render it relatively tight. Fabric shall be a minimum of 3" wide between connection points to sheetmetal. Glass fabric connections shall be Ventfabrics, Inc. "Metaledge Ventlon", or approved equal.

2.12 FLOW MEASURING STATION

- A. Contractor shall furnish and install flow measuring station to measure the flow through the piping system, one for each station as indicated on plans.
 1. The annular primary flow element shall be made of type 316 Stainless Steel and rated to 275 psig. Annular element shall be complete with permanent rust-proof metal identification tag on chain showing designed flow rates, meter readings or differential pressure outputs at designed flow rates, metered fluid, line size and tag, station or location number. Station sizes 1/2" to 1-1/4" shall be nipple section type, sizes 2" and 2-1/2" shall be either nipple section or weld insert type and size 3" and larger shall be weld insert type. Permanent pressure loss to the system shall not exceed 8.2% of the output differential on sizes over 1-1/2" and 2.9% on sizes over 5". Accuracy of the flow measuring elements shall be ± .55 to ± 2.3% as verified by independent laboratory reports.
 2. This system shall include annular primary element flow stations, and a portable meter set supplied by one manufacturer. Each annular measuring station shall be complete with safety shut-off valves and quick coupling connections of stainless steel. Measuring stations shall be rotatable sensing elements so that all pressure sensing ports can be pointed downstream when

station is not in use. Portable D.P. Meter Set shall be of the totally dry single diaphragm type with a 6-inch dial pointed indicator. It shall have wetted metal parts of only 316 Stainless Steel. It shall include a variable pulsation dampening control, an integral equalizing valve, and 2 bleed valves. Meter set shall be supplied complete with a master chart for direct conversion of meter readings to GPM, rust proof carrying case, two ten foot rubber test hoses, with brass valves for quick connections to Annubar. Meter shall become property of the Owner.

2.13 DIFFUSERS, REGISTERS, AND GRILLES

- A. Material and Finishes: Construction of diffusers, registers and grilles shall be extruded aluminum. All supply air outlets shall be supplied with gaskets to prevent smudging. Finish shall be white enamel. Grilles shall be as manufactured by Carnes, Anemostat, Krueger, Titus, Metalaire or approved equal.
1. Ceiling Diffusers: Diffuser shall be louvered face and symmetrical in design with 1" nominal flange type frame, removable core, and air distribution pattern as shown on drawings. Provide factory fabricated, single key operated, opposed blade volume damper.
 2. Supply Registers: Supply registers shall be double deflection type with 1" nominal flange, 1/4" horizontal face bar spacing, and removable core. Provide factory fabricated, key operated opposed blade volume damper.
 3. Return, Exhaust, Outside Air and Transfer Registers: Registers shall match supply registers except without double deflection.
 4. Return, Exhaust, Outside Air and Transfer Grilles: Grilles shall be same as specified for registers except without volume dampers.

2.14 BIRD SCREENS

- A. Bird screens shall be 1/2" x 1/2" wire mesh with 0.063 inch diameter stainless steel wire. Bird screen frame shall have mitered joints and be fabricated with stainless steel.

2.15 VOLUME DAMPERS

- A. Low Velocity (1,500 FPM or Less): Furnish and install Ruskin Model CD35 standard dampers suitable for use in temperature from 0°F to 200°F. Frames shall be 5" x 1" x 16 gage galvanized sheet hat channel. Blades shall be roll formed, triple V-groove 16 gage galvanized steel, maximum of 6" wide. Axles shall be 1/2" plated steel hex. Bearings shall be molded synthetic and linkage concealed in frame. Maximum single section size shall be 48" wide and 72" high. When applications require more than one damper section to fill opening, sections shall be interconnected by approximate jack shafting.
- B. Low Velocity/Low Leak For Outside Air Duct (1,500 FPM or Less): Furnish and install Ruskin Model CD35 standard dampers suitable for use in temperatures from -25°F to 180°F. Frames shall be 5" x 1" x 16 gage galvanized steel hat channel. Blades shall be roll formed, triple V-groove 16 gage galvanized steel, maximum of 6" wide. Axles shall be 1/2" plated steel hex. Bearing shall be molded synthetic and linkage concealed in frame. Maximum single section size shall be 48" wide

and 72" high. When applications require more than one damper section to fill opening, sections shall be interconnected by appropriate jack shafting.

2.16 TURNING VANES AND EXTRACTORS

- A. Factory-fabricated and factory-or-field-assembled units consisting of curved double thickness turning vanes for uniform air distribution and change of direction with minimum turbulence and pressure loss. Fabrication shall be in accordance with applicable SMACNA Publications.

2.17 DUCT ACCESS DOORS

- A. Hinged access doors shall be provided at all automatic dampers, fire dampers, heaters, thermostats, sensors and all other apparatus requiring service and inspection in the duct system. Access doors shall be 15 by 18 inches unless indicated otherwise. Where size of duct will not accommodate this size, access doors shall be made as large as practical. Doors shall be provided with galvanized continuous hinge with steel pin and galvanized steel cam latch at 12" O.C. maximum spacing. All doors 48 inches by 48 inches or larger shall be provided with fasteners that can be operated from both sides. Access doors in insulated ducts shall be of the insulated type with 1" foam or mineral fiber insulation. Doors in field fabricated air handlers shall be installed so that fan pressure or suction holds the door closed, unless otherwise indicated. Door and frame shall be galvanized sheetmetal.

2.18 DUCT TEST HOLES

- A. Holes with patches in ducts and plenums shall be provided where directed or necessary for using pitot tubes for taking air measurements to balance the air systems. At each of these locations where ducts or plenums are insulated, extension shall be provided with plug fittings.

2.19 UV-C LAMPS

- A. UVC Emitter and fixture shall be factory assembled and tested. They shall consist of a housing, power source, reflector, Emitter sockets and emitter and shall be constructed to withstand HVAC environments. They shall be UL listed for damp locations.
- B. Housing shall be constructed of hospital grade stainless steel and equipped with 1/2" conduit openings on each end to facilitate coupling fixture and wiring to power. It incorporate shall all components into one integral assembly that maximizes serviceability. It shall be designed to be mounted inside the airstream and downstream or upstream of the cooling coil.
- C. Power source shall be a Class P2, rapid start type with a power factor of 0.95 and a power conversion of not less than 70% in 115 Vac and shall be designed to maximize photon production, radiance and reliability in cold or moving air streams of 35-170°F, 100% RH and at any velocity. The design shall include RF and EMI suppression.
- D. Reflector shall be constructed of heavy gauge, specular finished aluminum alloy with a minimum 86% reflectance at 254 nm.

- E. Sockets shall be medium bi-pin, double click safety, twist lock type. They shall be constructed of a UVC resistant polycarbonate.
- F. Emitter tube shall be a very high output, hot cathode, T5 diameter, medium bi-pin type that produces broadband UVC of 250-260 nm. Each tube shall produce the specified output at any airflow velocity and air temperature of 35-170°F. It shall produce no ozone or other secondary contamination.
- G. Independent testing: When tested in accordance with the general provisions of IES Lighting Handbook, 1981 Applications Volume, output per 1" arc length shall be not less than 10 uW/cm² at 1 meter in a 400 FPM airstream of 45°F.

2.20 FIRE PROTECTION DEVICES

- A. Provide smoke detectors in the return and the supply air ducts in accordance with NFPA 90A. Detectors shall be UL listed for duct installation.
 - 1. Smoke Detectors: Provide in systems having air handling capacity over 2,000 cfm. Design for detection of abnormal smoke densities by the ionization principle, responsive to both invisible and visible particles of combustion, and not susceptible to operation by changes to relative humidity. Provide duct detectors with an approved duct housing, mounted exterior to the duct, and with perforated sampling tubes extending across the width of the duct. Activation of duct detectors shall cause shut down of the associated air handling unit and operation of dampers; and annunciation of the signal source and tripping of the master fire alarm box or other building fire alarm transmitter, but shall not cause sounding of the building interior alarm devices. Smoke control and exhaust systems shall have provisions for manual operation by means of a key operated switch to override any other shutdown features and shall be located adjacent to the fire alarm system control panel. Provide contacts for connection to fire alarm system.

2.21 DUCTWORK

- A. All sheet metal ducts shall be erected in a first class and workmanlike manner, true to the dimensions indicated on the drawings, unless otherwise approved, straight and smooth on the inside with neatly finished airtight joints. The ducts shall be securely anchored to the building in an approved manner and shall be so installed as to be completely free from vibration under all conditions of operation. The ducts shall be properly braced and reinforced with steel angles or other structural members. All slip joints shall be made in the direction of flow, and unless otherwise indicated on the drawings, all elbows shall have a centerline radius equal to 1-1/2 times the width of the duct or turning vanes shall be used. The sheet metal used shall be galvanized iron except as otherwise hereinafter specified. The thickness of the sheet metal and size and spacing of the stiffeners used shall be in accordance with the requirements of the latest edition of the ASHRAE Handbooks. Connections to diffusers, grilles and register faces shall be absolutely airtight.
 - 1. Duct pressure class shall be equal to or greater than 1.5 times the fan total static pressure.
 - 2. Seal all transverse joints on ducts with Deign Polymerics DP 1010, Foster 32-19 Fire Resistive Duct Sealer, Minnesota Mining and Mfg. Co. Duct

Sealer 800 Premium Grade, Polymer Adhesives Sealant Systems, Inc. Airseal # 22 or approved equal.

3. Flexible Duct: Flexible air duct shall be listed by Underwriters' Laboratories under UL 181 standards as Class 1 flexible Air Duct Material and complying with NFPA Standards 90A and 90B. Flexible duct shall be a factory fabricated assembly composed of a polymeric liner duct bonded permanently to a coated spring steel wire helix and supporting a fiber glass insulating blanket. Low permeability outer vapor barrier of fiber glass reinforced film laminate shall complete the assembly. Duct shall be rated for 6" w.g. positive pressure, 1" w.g. negative pressure, and operating temperature up to 250°F.

2.22 DUCT AND PLENUM INSULATION

A. Duct Wrap (Flexible Blanket):

1. Material: 1-1/2" flexible glass fiber blanket, 1.5 lbs. per cubic feet density, K factor not to exceed 0.25 at 75° mean temperature. Insulation shall be furnished with a factory applied foils scrim-kraft facing consisting of aluminum foil (minimum 0.7 mil thick) reinforced with fiberglass yarn mesh and laminated to 40 lb. chemically treated, fire resistant kraft. Insulation shall have a 25/50 flame and smoke rating when tested as a composite installation, including insulation, facing materials, tapes, and adhesives as normally applied in accordance with UL 723.
2. Application: Insulation shall be installed in accordance with manufacturer's recommendations.

B. Plenum Liner: Plenum liner shall be the same as duct liner except liner shall be 1-1/2" thick. Plenums located outside the building shall have 2" thick liner.

C. All substitution request shall include samples and manufacturers literature.

2.23 PIPE INSULATION

- A. Insulate all pipes with operating temperatures below 60°F and above 105°F, and where otherwise specified and/or indicated on drawings.
- B. Piping shall be insulated with rigid fiberglass pipe insulation with all service vapor barrier jacket. Insulation and jacket system shall have a flame spread rating of 25 and smoke develop rating of 50 when tested in accordance with ASTM E-84, NFPA 255 or UL 723. Insulation shall have maximum "K" factor of 0.23 BTU/S.F./°F at a mean temperature of 75°F. Insulation shall be 1" thick for pipe size 2 inches and smaller (except outdoors), 1-1/2" thick for pipes 2-1/2" thru 4", and 2" thick for pipes 5" and larger and all outdoor piping. Outdoor piping shall be all pipes exposed to outdoor ambient temperatures and humidity which includes natural ventilation area.
- C. Flanges, Couplings, Unions, Valves, and Fittings: Unless otherwise shown, shall be insulated with factory premolded, prefabricated or field-fabricated sections of insulation of the same material and thickness as the adjoining pipe insulation. Sections of insulation shall be secured in place with wire by joining the sector with Class 2 adhesive. Vapor barrier coating shall be applied over the insulation in two coats with glass tape or cloth embedded between coats. Cloth or tape shall overlap itself one inch and adjoining insulation jacket 2 inches. The coating shall

- be applied to a total dry film thickness of not less than 1/16 inch. In lieu of the above vapor barrier coating, factory premolded one piece polyvinyl chloride fitting covers may be used. When required, insulated flanges, couplings, unions, valves, and fittings shall be covered with preformed or field fabricated sections of aluminum jacket applied over the vapor barrier and secured with bands. Ends of pipe insulation shall be sealed to the pipe with a brush coat of vapor barrier coating at termination points, valves, flanges and fittings and on long runs of pipe at intervals not to exceed 15 feet.
- D. Clamp hangers in contact with pipe shall be insulated separately in the same manner as fittings. The insulation shall be applied upward along the vertical hanger rod to a point not less than 6" or 4 times the pipe insulation thickness and sealed off.
 - E. Hangers: Where 1" thick insulation is used, it shall be protected by 12" long metal shield at each hanger. Where 1-1/2" insulation is used, 12" long section of Foamglass pipe insulation with a Vapor Barrier Jacket shall be installed at the hanger point and protected with a 16-gauge metal shield on the outside of the jacket.
 - F. Outdoor pipe and accessories shall be additionally jacketed with 0.016" aluminum jacket. Jacket system shall provide a weatherproof barrier.
 - G. Insulation and jackets shall be installed in accordance with manufacturer's recommendations.
 - H. All valves and air release valves shall be insulated with 1-1/2" thick cellular glass insulation with vapor barrier conforming to ASTM C552, Class 1.

2.24 VALVES

- A. All valves shall be suitable for 125 lb steam working pressure minimum, and in accordance with the latest edition of ASTM and ANSI specifications as indicated:

ITEM	SIZE	DESCRIPTION
Gate Valves	2" and smaller	125-lb, SWP, bronze, rising stem double wedge disc, union bonnet, screwed ends.
	2-1/2" and larger	125-lb, SWP, IBBM, O.S.& Y, solid wedge disc, flanged ANSI B16.1.

2.25 PIPE HANGERS AND SUPPORTS

- A. All hangers, supports, bolts, nuts, washers, and accessories shall be galvanized unless otherwise specified.
 - 1. Refer to structural drawings for type of construction from which piping and/or equipment is to be suspended. Support from metal decking is prohibited unless specifically approved by the Structural Engineer.
 - 2. Drilled-In Threaded Inserts: Where supports in beams and joists are required after concrete has been poured, Phillips "Redhead" Drilled-In Threaded Inserts shall be provided, installed in accordance with manufacturer's recommendations.

3. Provide adjustable hangers, saddles, inserts, brackets, rolls, clamps, supplementary steel, etc., as required for proper support of all pipe lines. Hangers shall be designed to allow for expansion and contraction of pipe lines and shall be of adequate size to permit covering to run continuously through hangers. Piping at coils shall be supported independently so that no weight will be supported by the equipment. Coordinate location of hangers with light fixtures as shown on electrical drawings. Hangers provided under other sections shall not be used for support of piping or equipment provided under this section unless permission is granted in writing by the Architect. Hangers shall be of manufacture and type specified, or equivalent products. Manufactured by Anvil, B-Line, Erico, Superstrut or approved equal.
4. Pipe support spacing and hanger rod size shall conform to the following table:

Pipe Size	Pipe Support Spacing	Pipe Size	Rod Diameter
Steel Pipe			
1/2" and 3/4"	Not over 6'-0"	Up to 2"	3/8"
1-1/4" and 1"	Not over 6'-0"	2-1/2" to 3"	1/2"
1-1/2" and up	Not over 6'-0"	4" to 5"	5/8"
		6"	3/4"
		8" to 12"	7/8"
		Trapeze hangers as required	
Copper Pipe			
All sizes	Not over 6'-0"	Rod size same as steel for all pipe sizes	

5. Supplementary Steel: Provide all necessary supplemental structural steel for proper support or attachment of hangers. Steel shall be hot dipped galvanized.
6. Single Hangers: Support single pipe runs as follows:
 - a. Pipe 1/2" and Larger: Adjustable clevis hangers; Anvil Fig. 260.
 - b. Trapeze type hanger shall be used to provide necessary clearances.
7. Floor Support:
 - a. Pipes 2-1/2" and larger, Anvil Fig. No. 264 or approved equal with schedule 40 hot dip galvanized steel pipe support and floor flange.
 - b. Pipes 2" and smaller shall be fabricated of 2" x 2" x 1/4" angle with 2" schedule 40 hot dip galvanized steel pipe support and floor flange.
8. Insulation shields shall be Anvil Fig. 167, Fig. 20, Fig. 30 or equivalent field fabricated.
9. Pipes connected to equipment supported with vibration isolators shall be supported with spring isolators having a minimum static deflection equal to

vibration isolator supporting the equipment but need not exceed 1-1/2" static deflection.

- a. Pipes 1-1/2" and smaller within ten feet horizontal run from the equipment connections shall be supported with spring isolators.
- b. Pipes 2" and larger within twenty feet horizontal run from the equipment connection shall be supported with spring isolators.
- c. Pipe located in mechanical equipment room shall be supported with spring isolators.
- d. In addition to the above specified locations, pipes shall be hung from the spring isolator where indicated on the drawings.

2.26 SAFETY SWITCHES AND STARTERS

A. Equipment motor safety switch and starter shall be provided under this section. Three phase motor shall have overload protection devices on each leg sized according to the nameplate rating of motor. Enclosures shall be NEMA type as required by the location installed except that switches located in areas with fire sprinklers shall have weatherproof or raintight NEMA type 3R enclosure. Allen-Bradley, Westinghouse, General Electric, or approved equal.

1. Safety Switches: Safety switches shall be general or normal duty. The cover shall be interlocked so that it cannot be opened when the switch is in the "on" position. However, voidable interlocks shall be provided in order to bypass this feature when necessary. Switches shall be capable of being locked in the "off" position. Switches shall be fusible or non-fusible as indicated. Fusible switches shall be supplied with non-renewable fuses, sized as indicated. Where current limiting type or time-lag dual element fuses are indicated on the plans, switches shall be labeled to restrict fuses to the type indicated.
2. Magnetic Motor Starters: Starters shall be non-reversing, full-voltage type. Starters shall have three thermal overload protection heaters sized according to the nameplate ratings of the actual installed motor. Units shall have under-voltage protection when used with maintained contact control devices. The starter cover shall be equipped with push buttons or other control switches which are required for proper operation.
3. Voltage Monitor:
 - a. Provide a line voltage monitor for all equipment with motors 5 horsepower or larger. Power monitor shall de-energize equipment to prevent damaging equipment due to irregular power.
 - b. Power shall be monitored for Voltage unbalance, over/under voltage, phase loss, phase reversal, incorrect phase sequencing, faulty or degrading contacts, front side (source) fault, back side (load) fault, and rapid system recycling.
 - c. Light emitting diode display shall be provided for setup and diagnosis. Display shall indicate incoming line voltage, faults, and system setpoints.
 - d. System set points shall include:

February 27, 2026

- 1) Line voltage: 190-600 VAC
- 2) Voltage imbalance: 2-20%
- 3) Delay on break period: 0-10 minutes
- 4) Fault interrogation: 0-15 seconds
- 5) Over/under voltage: 2-25%
- 6) Reset modes Auto or 0-10 times.
- 7) Control modes: on-off

2.27 PRESSURE GAUGES

- A. Pressure gauges shall be Grade A, accurate within 1/2 of 1% of full scale range, of the Bourdon tube type, with 4-1/2" dials unless otherwise indicated, with recalibrating screws. Gauges shall have plain cases with screwed rings finished in black enamel and shall be installed with necessary piping, including a shut-off cock and pressure snubber. Gauges shall be Ashcroft, Marsh, Weiss, Terice, or approved equal. Provide a pressure snubber and gauge cock on each gauge. Gauges shall not be installed until systems are cleaned as specified elsewhere in this section. Gauges exposed to weather shall be factory weatherproofed.
- B. Pressure gauge ranges shall be such that the position of the pointer during normal operation will be 50% of dial range, or as noted on drawings.

2.28 THERMOMETERS

- A. Description: Mercury filled lens tube type with separable socket. Adjustable, 9 inch scale, 0°F to 120°F range with 2°F maximum scale divisions. Cast aluminum case, with adjustable angle case. Provide wells of suitable length to accommodate pipe size. Accuracy shall be within 1% of full scale.

PART 3 - EXECUTION

3.01 PROTECTION OF WORK IN PROGRESS

- A. Pipe and duct openings shall be closed with caps or plugs until connections are made. Equipment shall be securely covered for protection against physical or chemical damage. In areas exposed to weather, materials unused at the end of each day's work shall be stored in weather-protected locations. Damage to materials or equipment due to the Contractor's neglect shall be repaired or replaced to the satisfaction of the Architect by, and at the expense of the Contractor. Ductwork openings shall be covered and protected from dust and moisture daily. No equipment, ductwork, piping, or insulation shall be installed if
- B. contaminated by dust or moisture. Objects shall be cleaned or dried before installation.

3.02 PIPING

- A. Pipes shall be cut accurately to measurements established at the jobsite and worked into place without springing or forcing, properly clearing all windows, doors, and other opening. Cutting or other weakening of the building structure to facilitate piping installation will not be permitted without written approval. Pipes shall be cut

square, shall have burs removed by reaming, and shall be so installed as to permit free expansion and contraction without damage to joints or hangers. Fittings, dust, or dirt shall be wiped from interior of the pipe before connections are made. Changes in direction shall be made with fittings, except that bending of pipe will be permitted, provided a hydraulic or mechanical pipe bender is used and wide sweep bends are formed. Bent pipe showing any kinks, wrinkles, or other malformations will not be accepted. All piping shall be installed with sufficient pitch to ensure adequate drainage.

- B. Provide accessible pet cock air vent at all high points in piping system where air pockets may develop.
- C. Opening in pipes, fittings, and equipment shall be plugged or capped to prevent construction debris from entering.
- D. Valves and accessories shall be line size.

3.03 DIELECTRIC UNIONS AND FLANGES

- A. Dielectric unions or flanges shall be installed when connecting dissimilar metal water piping accessories or equipment.
- B. Copper water piping shall be isolated from ferrous material such as metal studs hanger or clamps by wrapping the pipe with plastic electricians tape.

3.04 JOINTS

- A. Copper tubing shall be cut square, ends reamed, and all shavings and dust wiped from the interior of the pipe. Joints in refrigeration piping shall be brazed with silver solder. Excess solder shall be wiped from the joint before the solder hardens.
- B. Screw joints shall be made with tapered threads properly cut conforming to requirements of NBS Handbook H 28. Joints shall be made perfectly tight with a stiff mixture of litharge and glycerin or other approved threaded joint compound applied with a brush to the male threads only. Not more than three threads shall show after the joint is made up.
- C. Unions: Unions shall be installed at all equipment and valves connections which are threaded. Dielectric unions or flanges shall be installed at all connections of dissimilar metals.
- D. Solder and solder flux shall not contain lead. Solder flux shall meet the requirements of ASTM B 813, "Standard Specifications for Liquid and Paste Fluxes for Soldering Applications of Copper and Copper Alloy Tube". The Contractor shall submit five (5) copies of certificates stating that the solder and fluxes used are lead free.

3.05 SLEEVES

- A. Pipes passing through wall waterproofing membrane or concrete floors shall be provided with pipe sleeves fitted into place at time of construction. Sleeves shall not be installed in structural members unless noted. Each sleeve shall extend through its respective wall or floor and shall be cut flush with each surface. Unless otherwise indicated, sleeves shall be of such size as to provide a minimum of 1/4" clearance between pipe or jacket over insulation and sleeves. Sleeves in bearing

- walls, waterproofing membrane floors, and wet areas shall be schedule 40 steel pipe or cast iron pipe.
- B. When penetrating waterproofing membrane for floors, the metal jacket shall extend from a point below the backup material to a minimum of 2 inches above the flashing sleeve. For other areas, the metal jacket shall extend from a point below the backup material to a point 12 inches above the floor, or when passing through walls shall extend a minimum of 4 inches on either side of the wall.
 - C. Where pipes or ducts penetrate fire rated walls and floors the space between the pipes or ducts and sleeves shall be sealed with fireproof sealant. Installation shall be in accordance with manufacturers instructions.

3.06 FLOOR, WALL, AND CEILING ESCUTCHEONS

- A. Escutcheons shall be provided at all finished surfaces where exposed piping, bare or insulated, passes through floors, walls or ceilings except in utility, or equipment rooms.
- B. Escutcheons shall be fastened securely to pipe or pipe covering and shall be chromium plated brass, either one piece or split pattern, held in place by internal spring tension or setscrew.

3.07 DUCTS

- A. Supports:
 - 1. Refer to structural drawings for type of construction from which ducts are to be suspended. Support from steel decking is prohibited unless specifically approved by the Structural Engineer.
 - 2. Drilled in Threaded Inserts: Where supports in beams and joists are required after concrete has been poured, Phillips "Redhead" Drilled In Threaded Inserts shall be provided, installed in accordance with manufacturer's recommendations.
 - 3. Ducts and accessories shall be supported in accordance with SMACNA HVAC Duct Construction Standards Metal and Flexible Ducts (1995). Additional hangers shall be provided within 6" of each cross sectional joint on each duct section. This will result in all duct sections having two hanger locations, one at each end.
- B. Duct Seams and Joints:
 - 1. Longitudinal seams shall be Pittsburgh seams, standing seams, grooved, or snap lock. Snap lock seams shall be formed with rollers and designed and set up specifically for the metal gage being worked. Seams shall be caulked.
 - 2. Transverse joints in low velocity round ducts shall be slip type secured with sheet metal screws equally spaced on 6" centers maximum with a minimum of 3 screws per joint. Exposed inside edge of duct at joint shall point in direction of air flow. Joints shall be sealed with an approved tape or mastic.
 - 3. All seams and joints in rectangular ductwork shall be constructed in accordance with ASHRAE Handbooks, except as otherwise noted.

February 27, 2026

- C. Duct Accessories: Turning vanes or extractors shall be installed in all changes in direction of air flow, whichever is applicable.
- D. Firestop around ducts penetrating floor slabs.
- E. Duct Leakage Testing:

1. Contractor shall leak test medium pressure ductwork from AHU discharge to terminal unit connections.
2. Contractor shall, at the beginning of the work construct, erect and leak test a representative sample of the duct construction to be used at the 3" pressure class. The sample specimen shall include at least five transverse joints, typical seams, and at least two typical branch connections plus two elbows, from the AHU discharge to the terminal unit.
3. The leakage amount shall not exceed the allotted amount for the pressure class or the allotted amount for that portion of the system, whichever is applicable.

DUCT CONSTRUCTION CLASS

3" w.g.

LEAKAGE CLASS

12

4. Leakage test procedures shall follow the outlines and classifications in the SMACNA HVAC Duct Leakage Test manual, and shall provide written test report results.
5. Contractor shall notify engineer a minimum of 3 days in advance of duct testing.
6. If specimen fails to meet allotted leakage level, the contractor shall modify to bring it into compliance and shall retest it until acceptable leakage is demonstrated. Engineer at his discretion may require additional duct sections tested.
7. Tests necessary repair shall be completed prior to concealment of ducts or installation of exterior duct wrap.

3.08 INSULATION

- A. Ducts: All air conditioning supply and return air ducts and outside air ducts shall be insulated with duct wrap.
 1. First 15 feet of supply and return air ducts from air handling equipment shall be additionally lined with duct liner.
 2. Duct wrap may be omitted on ducts that are lined, except inside machine rooms.
 3. Duct wrap shall overlap duct liner a minimum of 3".
 4. Accessories such as attenuators and volume dampers shall be provided with 1- 1/2" thick rigid fiberglass external insulation.
 5. All edges of duct and plenum liners shall be coated. Provide metal nosing at all supply and return duct connections to all air handling equipment.

- B. Kitchen Exhaust Ducts: Grease exhaust and other high temperature kitchen exhaust ducts located above ceiling shall have 1-1/2" thick external insulation as specified for chilled equipment except unfaced and rated for 350°F.
- C. Pipes: Insulate all chilled water pipes, condensate drain pipes, refrigerant suction pipes and refrigerant hot gas pipes between heat exchanger and compressor discharge. Butt joints on cold insulated pipes shall be sealed off with vapor barrier coating every 15 feet of straight run, immediately above penetration of each floor, and at the first joint on the horizontal pipe below a rise or drop of piping.
- D. Equipment: Insulate chilled water expansion tank, heat exchangers, chilled water pumps and other equipment with operating temperatures below 60°F or above 105°F. Pipes connecting to equipment which do not normally require insulation shall be insulated for at least 5'-0" run from equipment connection point.

3.09 PIPE PENETRATION

- A. Where pipe penetrate fire rated walls and floors the space between the pipe and pipe sleeve shall be sealed with fireproof sealant. Installation shall be in accordance with manufacturer's instructions.

3.10 TEMPERATURE CONTROLS

- A. General: Temperature controls shall be electric type that will provide the required sequence of operation and control. Items not specified herein or shown on the drawings but necessary to perform the functions specified shall be provided.
- B. Installation: The automatic equipment shall be installed by or under the direct supervision of the manufacturer's representative, in strict accordance with manufacturer's instructions. All control wiring or tubing shall be provided under this section of the specifications. Before the air conditioning installation is accepted, the Contractor shall deliver to the Architect a statement from the manufacturer or his authorized agent, certifying that the automatic control equipment has been inspected and found to be properly installed and is functioning satisfactorily.

3.11 THERMOMETERS

- A. Thermometers shall be installed at the inlet and outlet of all water chillers, heat exchangers and where shown on drawings.
- B. Thermometers shall be installed so they may be read by standing on the floor without the use of ladders.

3.12 PRESSURE GAUGES

- A. Pressure gauges shall be installed at the inlet and outlet of all pumps, water chillers, heat exchangers, pressure control valve, and where shown on drawings.
- B. Pressure gauges shall be installed with gauge cock and pressure snubbers to provide easy replacement and protection from pressure surges.
- C. Pressure gauges shall be installed so they may be read while standing on the floor without the use of ladders.

3.13 EQUIPMENT INSTALLATION

- A. Necessary supports shall be provided for equipment, appurtenances and pipe, as required. These include frames or supports for air conditioners, and other similar type items requiring supports.

3.14 VIBRATION ISOLATORS

- A. No rigid connections between equipment and building structure shall be made that degrades the noise and vibration isolation system herein specified. Electrical conduit connections to isolated equipment shall be looped to allow free motion of isolated equipment. Provide vibration isolators to vibrating and/or dynamic equipment, and install per equipment manufacturer's instructions.

3.15 CLEANING AND ADJUSTING

- A. Pipes shall be cleaned free of scale and thoroughly flushed of all foreign matter. Strainers and valves shall be thoroughly cleaned. Equipment shall be wiped clean, with all traces of oil, dust, dirt, or paint spots removed. Temporary filters shall be provided for all fans that are operated during construction, and after all construction dirt has been removed from the building, new filters shall be installed.
- B. Bearings shall be properly lubricated with oil or grease as recommended by the manufacturer. Belts shall be tightened to proper tension. All control valves and other miscellaneous equipment requiring adjustment shall be adjusted to setting indicated or directed. Fans shall be adjusted to the speed indicated by the manufacturer to meet specified conditions. Clean all strainer screens 10 days after acceptance of this project.

3.16 PIPE PRESSURE TEST

- A. Hydrostatically test water piping systems at one and one half times the system pressure but at least 150 psig. Pressure shall be maintained for a period of not less than eight hours without pressure loss. Leaks found during test shall be repaired. Caulking of joints will not be permitted. Concealed piping shall be tested in place before concealing.

3.17 LEAK TESTING

- A. Upon completion of installation of the system before any piping is insulated, test factory - and field-installed refrigerant piping with an electronic-type leak detector. Use same type of refrigerant to be provided in the system for leak testing. When nitrogen is used to boost system pressure for testing, ensure that it is eliminated from the system before charging. Minimum refrigerant leak field test pressure shall be as specified in ASHRAE 15, except that test pressure shall not exceed 1034 kPa (gage) 150 psig on hermetic compressors unless otherwise specified as a low side test pressure on the equipment nameplate. If leaks are detected at time of installation or during warranty period, remove the entire refrigerant charge from the system, correct leaks, and retest system.

3.18 TESTING, ADJUSTING AND BALANCING SYSTEMS

- A. The Contractor shall obtain the services of an independent test and balance agency that specializes in and whose business is limited to the testing and balancing of air conditioning systems.

February 27, 2026

- B. Testing, adjusting and balancing shall be performed in complete accordance with ASHRAE Testing, Adjusting and Balancing. Recommendations by ASHRAE shall be considered mandatory. Adjustment of equipment and air outlet quantities to suit actual field conditions shall be within the scope of Testing, Adjusting and Balancing.
- C. Instruments used for testing and balancing of air and hydronic systems must have been calibrated within a period of six months and checked for accuracy prior to start of work.
- D. Six copies of the complete test report shall be submitted to the Architect prior to final acceptance of the project. Reports shall be submitted on standard SMACNA Forms.
- E. All strainer screens shall be removed, cleaned and reinstalled after 8 hours of operation and prior to balancing.
- F. All air filters shall be replaced with new filters after 8 hours of operation and prior to balancing.
- G. Balancing:
 - 1. Variable Flow Chilled Water System Balancing: The following procedures shall be used to balance a variable flow chilled water system.
 - a. Close coil valves except the one on the critical branch that appears to have the highest pressure drop. This valve shall be left wide open.
 - b. Adjust the differential pressure controller so that the pump delivers design flow through this branch.
 - c. Then close the coil valve on this branch and run the pump at full speed to be sure that there is no flow in the branch and that the actuator closes the valve tightly against the maximum pump head. Check chiller chilled water flow to make sure minimum flow is achieved.
 - d. Check the other branches in the same manner to ensure that the drop on the remaining branches is less than the apparent critical branch and that all valves close tightly.
 - e. If another branch has a higher pressure drop, then reset the differential pressure controller upward to satisfy this branch.
 - 1) When testing the pressure drop in the branches, all readings may be taken at the remote coil branch where the differential pressure sensor is located. There is no flow and, therefore, no pressure drop in the main between the sensor and the branch under test.
 - 2) It is not necessary to move the differential pressure test gauge to the branch being tested because the differential pressure will read the same across the branch as it reads across the sensor as long as all other branch valves are closed.
 - 3) If the building has an operational DDC system, all branch flows and all valves may be tested at the DDC console when the testing procedure outlined above is followed.

- 4) The branch differential pressure may all be read across the hydraulically most remote branch sensor and the branch flows may all read through flow sensor FS-1 located at the CHR main to the chilled water plant. This procedure shall also be done annually, as part of the maintenance program, to detect any valves that have deteriorated and may not be closing tight.
2. Duct systems shall be balanced as follows:
 - a. System (or air moving device) to not less than design CFM. Adjusting shall include changing of sheaves to suit field static pressures.
 - b. Control zones or major duct branches to plus or minus 5%.
 - c. Registers and grilles, initially, to plus or minus 10%, thereafter, adjust to field conditions.
3. Test Data: The Contractor shall provide the Architect with typewritten schedules of readings taken during the balancing and testing operations indicating the required or specified reading, the first reading taken, and final balanced reading for the following items:
 - a. Fans: Size, Type, speed in rpm, outlet velocity in fpm, static pressure in inches of water, air quantity in cfm, and motor load in amperes. Fan pulleys shall be changed or adjusted to meet system field static pressure requirement.
 - b. Air Handling Units: Size, type, fan speed in rpm, outlet velocity in fpm, external static pressure in inches of water, total static pressure in inches of water, air quantity cfm, and motor load in amperes.
 - c. Air outlets and inlets: Size, velocity in fpm, and air quantity in cfm.
 - d. Coils: Size; face velocity in fpm; air temperature entering coil and air temperature leaving coil, wet-bulb and dry-bulb degrees F.; water temperature entering coil and water temperature leaving coil, degrees F; and water quantity in gpm.
 - e. Ducts: Size, velocity in fpm, and air quantity in cfm.
 - f. Control Settings: On-site settings for all automatic controls including thermostats, humidity controls, safety controls, minimum damper settings, fire-safety thermostats, pressure controls, temperature controls, and other similar items shall be provided in the form of a typed tabulated list indicating type of control, location, setting, and function.
 - g. g. Fill out attached Operational Performance Test form.

3.19 PAINTING

- A. Painting shall be as specified in Section 09900 - PAINTING.

3.20 SPARE-PARTS DATA

- A. After approval of materials and equipment and 2 months prior to the date of beneficial occupancy, the Contractor shall furnish a complete list of parts and supplies, with current source of supply.

3.21 OPERATING AND MAINTENANCE MANUAL

- A. Provide operating and maintenance manual on all equipment and the system in accordance with Section 15011- GENERAL MECHANICAL PROVISIONS.

3.22 FIELD INSTRUCTIONS

- A. Upon completion of the work and at a time designated, the services of one or more qualified personnel shall be provided by the Contractor for a period of not less than 2 days to instruct the Owner's representative in the operation and maintenance of the air conditioning system and ventilation system. These field instructions shall cover all the items contained in the bound instructions.

3.23 VALVE TAGS AND INDEX

- A. Identification tags made of brass or aluminum shall indicate valve number, function, size, and working pressure and shall be installed on all valves. Tags shall be 1-1/2 inches minimum in diameter, and marking shall be stamped. Tags shall be wired to valve with 0.0808-inch diameter, No. 12 AWG, copper wires. Furnish a chart indicating location, index number and purpose of all valves for the Architect's review and approval.

3.24 STANDARDIZED PIPE IDENTIFICATION SYSTEM

- A. Use an arrow marker with each pipe content marker, the arrow shall always point away from the pipe marker and in the direction of flow.
- B. If flow can be in both directions, use a double headed arrow marker.
- C. Apply pipe marker and arrow marker at every point of pipe entry or exit where line goes through wall.
- D. Apply pipe marker and arrow marker on each riser and "T" joint.
- E. Apply pipe marker and arrow marker every 20 feet on long continuous lines.
- F. Apply markers on the two lower quarters of the pipe and where view is unobstructed.
- G. Arrow markers shall be 4 inches long minimum, and pipe content marker lettering sizes shall be 1-1/2 inches minimum in height.

3.25 ONE YEAR GUARANTEE AND MAINTENANCE SERVICE CONTRACT

- A. In addition to the Guarantee on material and workmanship, the installer shall submit seven copies of the Maintenance Service Contract, countersigned by the General Contractor, that will validate said Guarantee.
- B. The Guarantee and maintenance service shall extend for a period of one year commencing after 30 consecutive days of trouble-free operation after the Project Acceptance Date or the air conditioning equipment acceptance date, if earlier than the Project Acceptance Date, and shall include all labor, materials, equipment and parts necessary to service the complete system, in accordance with the attached Schedule of Maintenance Service, so as to assure proper operation and function of the system. All costs for the periodic maintenance, including emergency calls, shall be borne by the Contractor. This maintenance period and the guarantee period shall run concurrently (same start and end dates).

February 27, 2026

- C. Trouble-free operation is defined as a non-disabling condition or a non-recurring failure or disruption and the following:
 - 1. The system shall be free of all discrepancies, contamination and debris which requires correction in excess to those described for the monthly service which is included in the Schedule of Maintenance Service.
 - 2. The system is maintaining operational conditions and other parameters as measured during acceptance test.
- D. The Contractor shall keep a separate log recording all regular and emergency maintenance calls to the project at his office. The log shall include at least the following information:
 - 1. Name of person making service call.
 - 2. Date of call.
 - 3. Time in and out from project.
 - 4. Nature of call; if emergency, who contacted service company.
 - 5. Temperature and pressure readings from all available pressure gauges and thermometers. Readings from all other gauges, thermometers, level indicators, status indicators, sensors, Ambient temperature and humidity at the site.
 - 6. The type and cost (labor, materials, parts and equipment) of repair work performed on the unit, if any.
 - 7. All items indicated to be recorded in the Schedule of Maintenance Service.
 - 8. Other data required.
- E. In addition, the Contractor shall submit written reports of maintenance service performed within 5 working days of performance of service to the Owner. The maintenance service report shall include pertinent pages of the maintenance log.
- F. The Installer shall include a listing of the following items along with the Maintenance Service Contract:
 - 1. Name of the Servicing Contractor.
 - 2. Air Conditioning system acceptance date.
 - 3. Service contract expiration date. Service contract expiration date shall be amended after the completion of the 30 consecutive days of trouble free operation specified in paragraph B. above.
 - 4. Monthly inspection schedule for the maintenance period.
 - 5. Itemized listing of the equipment covered under the service contract, including a description of the equipment identified, its model and serial number(s) and manufacturer's name(s).
- G. The Maintenance Service Contract shall be submitted along with the Operations and Maintenance Manual 30 days before the Project Acceptance Date.
- H. Certification of Maintenance Work: All work done under this maintenance contract shall be certified by a responsible employee of the Contractor who is in charge of or who performs the maintenance work. Service reports shall be made out for all

service periods, i.e., monthly, quarterly, semi-annual, annual, emergency, etc.. Certification of work by the Contractor shall be construed to mean that work has been performed in accordance with recommended and accepted maintenance procedures in conformance with the full intent of the service contract. Service reports shall include findings by the service personnel and description of work performed to maintain the systems in proper operating condition.

- I. Work Schedule/Advance Notification:
 - 1. All maintenance work shall be performed between the hours of 7:30 a.m. to 4:00 p.m., on normal working days, Monday through Friday, excluding State Holidays.
 - 2. Contractor shall notify Owner prior to any maintenance work that will cause mechanical equipment outages or in any way affect the facility's user in the performance of their duties. Contractor shall inform the Owner a minimum of five (5) working days in advance of any work.
- J. Trouble Calls: Emergency service and repairs required between regular service calls shall be rendered within 24 hours after the Contractor is notified, non-work days included.
 - 1. The Contractor shall call Owner's representative the next working day after being notified of the problem and report the status of repairs.
- K. Maintenance Report/Checklist: The Contractor shall prepare and maintain a maintenance service report/checklist which shall include the following:
 - 1. Date maintenance service was performed.
 - 2. The name of the mechanic who performed said maintenance.
 - 3. The type and cost (labor, materials, parts and equipment) of repair work performed on the unit, if any.
 - 4. Documents and other data pertaining to the maintenance performed.
 - 5. It will be the responsibility of the Contractor to maintain the report/checklist by recording the above noted data after each scheduled maintenance and emergency repairs, and have the checklist available for inspection at the building site. The report shall be sufficiently detailed to properly reflect the past maintenance history of the equipment.
 - 6. Reports shall be certified by a representative of the facility being served and shall be submitted to Owner at the completion of the Service Contract.
- L. Cleanup and Work Practices: The Contractor shall keep the job site free of debris, litter, discarded parts, etc. and shall clean all oil drippings during the daily progress of work. The Contractor shall remove all tools, parts, and equipment from the service areas upon completion of the work.
- M. The Contractor shall exercise caution during the progress of his maintenance and repair work to prevent damage to the ceilings, roofing and other building structure. The Contractor shall restore all damages, caused by his negligence, to its original condition, at his own expense.

N. All periodic maintenance services performed by the Contractor shall include applicable items listed but shall not be limited to the following maintenance tasks outlined in the Schedule of Maintenance Service below:

1. AIR HANDLING UNIT/FAN COIL UNIT

a. Monthly Service

- 1) Clean and clear all drain pan and flush all related condensate drain line with compressed air. Install drain pan tablets to control algae growth. Repair, record and report all discrepancies and actions taken.
- 2) Change all disposable air filters at least once a month. Use filters of equal capacity and performance characteristics as original design. Repair, record and report all discrepancies and actions taken.
- 3) Wash permanent type filters with an approved detergent and spray coat with an approved filter treatment solution. Replace deteriorated permanent type filters which cannot be cleaned. Repair, record and report all discrepancies and actions taken.
- 4) Perform operational test of all motorized inlet vanes and variable frequency drives (VFD) where installed, to ensure that equipment is operating properly. Correct, record and report all discrepancies and actions taken.
- 5) Lubricate and oil all fan and motor bearings, connections of dampers and vanes, linkages, automatic motors, valves, and actuators. Correct, record and report all discrepancies and actions taken.
- 6) Check all drives for wear; adjust belt tension if necessary. Change belts as required. Correct, record and report all discrepancies and actions taken.
- 7) Check pressure and temperature differential across cooling coils and log readings. Clean strainers, vents and drains on chilled water coils. Correct, record and report all discrepancies and actions taken.
- 8) Operate equipment to check for proper operation, unusual noise and vibration; adjust or repair all equipment and controls as required; clean-up all equipment. Provide operational simulation of controls at various conditions. Correct, record and report all discrepancies and actions taken.
- 9) Check time clock for proper operation and time settings. Readjust as required. Correct, record and report all discrepancies and actions taken.
- 10) Read and record motor power supply voltage and amperes. Correct, record and report all discrepancies and actions taken.
- 11) Certify performance of monthly scheduled maintenance service and that all discrepancies have been reported and corrected.

b. Annual Service

- 1) Adjust alignment of bearings and sheaves; lubricate fan and motor bearings. Replace worn or noisy bearings or sheaves. Repair, record and report all discrepancies and actions taken.
- 2) Check condition of fan blades. Replace fan wheel as required. Repair, record and report all discrepancies and actions taken.
- 3) Clean cooling coils of dirt accumulation using nitrogen, high pressure air/water, steam, or chemical coil cleaner solution. Correct, record and report all discrepancies and actions taken.
- 4) Clean supply and return air grilles, registers, and diffusers, and outside air intake grilles, screens and dampers. Repair or replace deteriorated bird screens. Correct, record and report all discrepancies and actions taken.
- 5) Clean and adjust water valves, clean strainers and clean all fan wheels and interior and exterior of equipment housings. Correct, record and report all discrepancies and actions taken.
- 6) Secure all loose housing, seal leaks and touch up paint after cleaning rust. Correct, record and report all discrepancies and actions taken.
- 7) Check and calibrate control valve. Repack valve stem as necessary. Correct, record and report all discrepancies and actions taken.
- 8) Service thermostats, clean, and calibrate. Correct, record and report all discrepancies and actions taken.
- 9) Check and calibrate all pneumatic and/or direct digital and/or electric/electronic temperature controls. Correct, record and report all discrepancies and actions taken.
- 10) Check and record motor power supply voltage and amperes. Record chilled water supply and return temperatures, chilled water supply and return pressures. Correct, record and report all discrepancies and actions taken.
- 11) Certify performance of annual scheduled maintenance service and that all discrepancies have been reported and corrected.

2. VENTILATING FANS (Exhaust and Supply)

a. Quarterly Service

- 1) Check motor-controlled and back-draft dampers for proper operation; lubricate linkage for free movement. Correct, record and report all discrepancies and actions taken.
- 2) Lubricate fan motors and bearings. Correct, record and report all discrepancies and actions taken.
- 3) Check belt wear and tension and record findings; adjust or replace as needed. Correct, record and report all discrepancies and actions taken.

- 4) Check sheaves for wear and record findings. Replace as needed. Correct, record and report all discrepancies and actions taken.
 - 5) Check fan collar, bearings, and shaft for wear. Correct, record and report all discrepancies and actions taken.
 - 6) Replace air filters where installed; clean grilles, registers and diffusers. Correct, record and report all discrepancies and actions taken.
 - 7) Read and record motor power supply voltage and amperes. Correct, record and report all discrepancies and actions taken.
 - 8) Check two-speed motor for proper operation; check refrigerant sensor control of motor speed for proper operation. Correct, record and report all discrepancies and actions taken.
 - 9) Certify performance of quarterly scheduled maintenance service and that all discrepancies have been reported and corrected.
 - b. Semi-Annual Service
 - 1) Check and clean fan wheels and housings of dust, dirt, and grease. Correct, record and report all discrepancies and actions taken.
 - 2) Remove and wash all intake grilles and dampers and repair or replace deteriorated bird screens. Correct, record and report all discrepancies and actions taken.
 - 3) Certify performance of semi-annual scheduled maintenance service and that all discrepancies have been reported and corrected.
3. TEMPERATURE AND CONTROLS
- a. Quarterly Service
 - 1) Check automatic dampers for tightness in closing; check for bent blades and defective linkage; lubricate connections for free movement. Correct, record and report all discrepancies and actions taken.
 - 2) Lubricate all actuators, damper motors, plungers, valves. Correct, record and report all discrepancies and actions taken.
 - 3) Adjust thermostat to maintain a design room temperature of 75°F, and other set points required by building users. Correct, record and report all discrepancies and actions taken.
 - 4) Calibrate all thermostats with controlling devices. Correct, record and report all discrepancies and actions taken.
 - 5) Certify performance of quarterly scheduled maintenance service and that all discrepancies have been reported and corrected.
 - b. Annual Service
 - 1) Calibrate all thermostats with controlling devices. Correct, record and report all discrepancies and actions taken.

- 2) Certify performance of annual scheduled maintenance service and that all discrepancies have been reported and corrected.

4. PACKAGE AIR CONDITIONER

a. Monthly Service

- 1) Clean and clear all drain pan and flush all related condensate drain line with nitrogen or compressed air. Install drain pan tablets to control algae growth. Contractor will be liable for water damage due to clogged drains under this contract. Repair, record and report all discrepancies and actions taken.
- 2) Change all disposable air filters at least once a month. Use filters of equal capacity and performance characteristics as original design. Repair, record and report all discrepancies and actions taken.
- 3) Replace deteriorated permanent type filters which cannot be cleaned. Repair, record and report all discrepancies and actions taken.
- 4) Perform operational test of all motorized inlet vanes and variable frequency drives (VFD) where installed, to insure that equipment is operating properly. Repair, record and report all discrepancies and actions taken.
- 5) Lubricate and oil all fan and motor bearings, connections of dampers and vanes, linkages, automatic motors, valves, and actuators. Correct, record and report all discrepancies and actions taken.
- 6) Check all drives for wear; adjust belt tension if necessary. Change belts as required. Correct, record and report all discrepancies and actions taken.
- 7) Check pressure and temperature differential across cooling coils and record readings. Correct, record and report all discrepancies and actions taken.
- 8) Operate equipment to check for proper operation, unusual noise and vibration; adjust or repair all equipment and controls as required; clean-up all equipment. Provide operational simulation of controls at various conditions. Correct, record and report all discrepancies and actions taken.
- 9) Check time clock for proper operation and time settings. Correct, record and report all discrepancies and actions taken.
- 10) Read and record motor power supply voltage and amperes. Correct, record and report all discrepancies and actions taken.
- 11) Check Compressor oil level and refrigerant sight glass. Add oil as needed and change filter/drier if moisture is indicated. Correct, record and report all discrepancies and actions taken.

- 12) Check refrigerant system for leaks, unusual noise and vibration. Record suction, discharge and oil pressures. Correct, record and report all discrepancies and actions taken.
 - 13) Certify performance of monthly scheduled maintenance service and that all discrepancies have been reported and corrected.
- b. Annual Service
- 1) Adjust alignment of bearings and sheaves; lubricate fan and motor bearings. Replace worn or noisy bearings. Repair, record and report all discrepancies and actions taken.
 - 2) Check and record condition of fan blades. Replace fan wheel as required. Repair, record and report all discrepancies and actions taken.
 - 3) Clean cooling coils of dirt accumulation using nitrogen, high pressure air/water, steam, or chemical coil cleaner solution. Repair, record and report all discrepancies and actions taken.
 - 4) Clean supply and return air grilles, registers, and diffusers, and outside air intake grilles, screens and dampers. Repair or replace deteriorated bird screens. Correct, record and report all discrepancies and actions taken.
 - 5) Clean and adjust valves, and clean all fan wheels and interior and exterior of equipment housings. Repair, record and report all discrepancies and actions taken.
 - 6) Secure all loose housing, seal leaks and touch up paint after cleaning rust. Repair, record and report all discrepancies and actions taken.
 - 7) Check and calibrate control valve. Repack valve system as necessary. Repair, record and report all discrepancies and actions taken.
 - 8) Service thermostats, clean, and calibrate. Repair, record and report all discrepancies and actions taken.
 - 9) Check and calibrate all pneumatic and/or direct digital and/or electric/electronic temperature controls. Repair, record and report all discrepancies and actions taken.
 - 10) Check and record motor power supply voltage and amperes. Correct, record and report all discrepancies and actions taken.
 - 11) Check compressor coupling alignment. Lubricate or replace noisy bearings. Correct, record and report all discrepancies and actions taken.
 - 12) Clean condenser coils of dirt accumulated using nitrogen, high pressure air/water, steam or chemical coil cleaner solution. Correct, record and report all discrepancies and actions taken.
 - 13) Test compressor crankcase oil and replace if contaminated. Submit test results with maintenance service report. Clean or

replace strainer and oil filter. Correct, record and report all discrepancies and actions taken.

- 14) Test and check system response at various cooling load conditions for proper operation. Record settings, adjust as required. Recalibrate all safeties, capacity, and temperature controls to proper settings. Correct, record and report all discrepancies and actions taken.
- 15) Check and clean the inside and outside of all unit housing. Seal leaks and remove rust from exterior components and touch-up paint. Correct, record and report all discrepancies and actions taken.
- 16) Megger (electrical test to measure wire insulation resistance, i.e. condition) compressor motor and submit report and recommendation. Check starter, relays, and control contacts. Check electrical connections for tightness. Correct, record and report all discrepancies and actions taken.
- 17) Certify performance of annual scheduled maintenance service and that all discrepancies have been reported and corrected.

5. AIR FILTERS

a. Monthly Service

- 1) Replace filters. Repair, record and report all discrepancies and actions taken.
- 2) Check for leaks at filter access. Repair, record and report all discrepancies and actions taken.
- 3) Certify performance of monthly scheduled maintenance service and that all discrepancies have been reported and corrected.

SERVICE MAINTENANCE REPORT

DATE: _____ SHEET NO. _____

1. Name of Facility and Location: _____
2. Submitted By: _____

3. Date of Service Call: _____
4. Name of Person(s) Making Call: _____
5. Time In; Time Out at Site: _____
6. Person(s) Contacted: _____

7. Nature of Service Call: (Routine Maintenance, or Emergency Explain).

8. Equipment Readings and Maintenance Performed: (List all items serviced; identify - 8a, 8b, 8c...etc.)

February 27, 2026

9. Remarks:

[illegible]

Signature of Person Making Report:

END OF SECTION

DIVISION 16 - ELECTRICAL

SECTION 16011 - GENERAL ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

As specified in SECTION 00700.

1.02 SUMMARY

- A. Provide all labor, materials, equipment, supervision and services required for the construction of the electrical systems. Finished installations shall be complete, operable and including all work specified herein and shown on the Drawings.
- B. Work includes complete testing of all equipment and wiring at the completion of the work and making any minor connection changes or adjustments necessary for the proper functioning of the system and equipment. All systems properly adjusted and in working order at time of final acceptance.
- C. All concrete, steel reinforcement, miscellaneous metal-work, earthwork, painting, and grouting shall conform to the applicable requirements of the detailed equipment specifications as prescribed in appropriate sections.
- D. Where a specific manufacturer and model number are indicated, followed by "or accepted equivalent". Contractor responsible to research the specified equipment and to provide a similarly manufactured substitute for approval, if substitution is desired.
- E. Intent of these Specifications and other Contract Documents require an installation complete in every detail. Consequently, Contractor responsible for minor details or for any special construction which may be found necessary to properly furnish, install, adjust, test, and place in successful and continuous operation the entire electrical system.

1.03 DESCRIPTION OF WORK

Work specified in this Division shall include, but not be limited to the following:

- 1. Complete electrical system wiring including branch circuits, luminaires, switches, receptacles, outlets and control devices.
- 2. Complete lighting and control systems, including time switches, lighting contactors and dimmers.
- 3. Empty raceways for telephone, CATV and security distribution systems. Install security cables furnished by others.
- 4. Power wiring for electrically-operated equipment and appliances.
- 5. Complete fire alarm system.
- 6. Permits, inspections and delivery of final inspection certificate to Architect.
- 7. Testing.
- 8. Record drawings.

1.04 REFERENCES

Comply with the applicable requirements of the following standards unless otherwise indicated:

1. Comply with local ordinances; National Electrical Code; applicable regulations of the National Board of Fire Underwriters; specifications of ANSI, NEMA, UL, EEI, and IPCEA; and regulations of the City and County of Honolulu Building Department.
2. In the event of conflict between pertinent codes and regulations, and the requirements of the referenced standards, or those indicated in Specifications and on Drawings, the provisions of the more stringent shall govern.

1.05 RELATED WORK

- A. DIVISION 3 - CONCRETE.
- B. DIVISION 9 - FINISHES.
- C. DIVISION 11 - EQUIPMENT.
- D. DIVISION 15 - MECHANICAL.

1.06 PERMITS AND INSPECTION

- A. Obtain and pay for all permits required by local ordinances.
- B. After completion of the work, provide certificate of final inspection and approval from the City and County of Honolulu Building Department.

1.07 COORDINATION

- A. Refer to all project Drawings and to all Sections of the project Specifications. Coordinate and fit all work accordingly so that all electrical outlets and equipment will be properly located and readily accessible. The Drawings indicate the relation of wiring and connections and must not be scaled for exact locations. Verify all construction dimensions at the project and make changes necessary to conform to the building as constructed. Work improperly installed due to lack of construction verification shall be corrected at the Contractor's expense.
- B. Schedule work to avoid delays, interferences, and unnecessary work. If any conflicts occur necessitating departures from the Drawings and Specifications, details of departures and reasons therefore shall be submitted immediately for consideration by the Architect.

1.08 SUBMITTALS

- A. Submit in accordance with SECTION 01330 - SUBMITTAL PROCEDURES.
- B. Submit shop drawings and catalog cuts of the equipment and products identified in each DIVISION 16 - ELECTRICAL technical section for approval. Each submittal shall be prepared with a summary sheet attached to each copy individually identifying all items included in the submittal. Incomplete submittals and those without summary sheets will be returned without review.

1.09 DELIVERY, HANDLING AND STORAGE

February 27, 2026

- A. Deliver all materials of this Division in manufacturer's original unopened packages or containers with label intact and legible.
- B. Use means necessary to protect the materials of this section before, during and after installation; to protect the installed work and materials of all other trades; and to protect the original structure, work and materials of the Owner.
- C. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

1.10 WARRANTY

- A. Installation complete in every detail as specified and ready for use. Any items supplied by Contractor developing defects of design, construction, or quality within one year of final acceptance by the Owner shall be replaced by such new materials, apparatus or parts to make such defective portion of the complete system conform to the true intent and meaning of the Drawings and Specifications at no additional cost to the Owner. Lamps shall be warranted for 50 percent of rated lamp life.
- B. Warranty countersigned by the General Contractor.

PART 2 - PRODUCTS

2.01 MATERIALS AND WORKMANSHIP

- A. All materials shall conform to the latest issue of all applicable standards as established by NEMA, NFPA, ANSI, IEEE, ASTM and Underwriters' Laboratories, and shall bear the manufacturer's name and trade name and when available, the Underwriters' Label.
- B. Neat appearances in the finished work required.
- C. All work not installed and completed in accordance with the latest rules and regulations of the NEC, OSHA, NESC, and all local ordinances shall be removed and reinstalled correctly at the Contractor's expense.

PART 3 - EXECUTION

3.01 GENERAL

- A. Install all electrical materials and equipment in accordance with manufacturer's recommendations and as approved by the Architect for the seismic zone 2 classification at the project site.
- B. Cut, break, drill and patch as required to install electrical system. Repair any surface damaged or marred by notching, drilling or any other process necessary for installation of electrical work. Patch any damaged surfaces to match the existing surface.
- C. All wiring and overcurrent devices for equipment furnished by other trades are sized for a contemplated equipment size. If equipment other than contemplated and indicated on the plan is provided, the Contractor shall be responsible for providing the required wiring, switches, and overcurrent devices at no cost to the Owner. Submit the proposed revisions to the electrical design to the Architect for approval.

February 27, 2026

- D. Coordinate work with other trades to avoid conflicts with mechanical, structural, landscape and architectural elements of this project.
- E. Follow installation and service instructions for all equipment furnished by the Owner for installation by the Contractor.

3.02 JOBSITE CONDITIONS

- A. These specifications are accompanied by construction drawings including building and site plans of all trades showing locations of all outlets, switches, service runs, feeder runs, devices, and other electrical equipment. The locations are approximate and before installing, study adjacent architectural details and make installation in most logical manner. Any device may be relocated within 10'-0" before installation at direction of Architect without additional cost to Owner.
- B. Before installing, verify all dimensions and sizes of equipment.
- C. Verify that electrical system may be installed in strict accordance with the original design, the Drawings and Specifications and the manufacturer's recommendations.
- D. In the event of discrepancy, immediately notify the Architect. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.03 CONNECTIONS TO MECHANICAL, AND ALL EQUIPMENT PROVIDED BY OTHER TRADES

- A. Provide conduit, wiring and all electric connections from building wiring to motors for ventilation, air conditioning, and other equipment, including all switches, motor protection devices, as specified by other trades.
- B. Ascertain from other trades furnishing motor-driven equipment, the exact size and types of motors, the exact locations of such equipment and the proper point where electrical connections should be brought through the floors or walls, as the case may be. Locations shown on the drawings are diagrammatic only; correct locations shall be the full responsibility of the Contractor.
- C. Examine Mechanical and other Drawings and Specifications for information concerning motors and control apparatus and diagrams.
- D. Install individually mounted starters furnished for motors under other Divisions or Separate Contracts. Provide safety switches as necessary for each such motor.
- E. All control devices and control wiring provided by others shall be provided as described in the installation manuals of equipment and/or the Drawings and Specifications of other trades and disciplines.

3.04 DEMONSTRATION OF COMPLETE ELECTRICAL SYSTEMS

- A. Submit written certification that electrical systems are complete and operational. Submit certification with Contractor's request for final review.
- B. At the time of final review of electrical work, demonstrate the operation of electrical systems. Provide labor apparatus and equipment for systems' demonstration.
- C. Provide all test equipment, materials, and labor to perform all tests as required to obtain final field acceptance from the Owner. All tests conducted in the presence

February 27, 2026

of the Architect or his representative. All test procedures shall conform to this specification and applicable standards the ANSI, IEEE, NEMA, OSHA, NFPA. etc.

- D. The Contractor responsible for all tests and test records. Testing performed by and under the immediate supervision of the Contractor. Keep test records for each piece of equipment. Furnish copies to the Architect for his review and/or approval.
- E. Perform a visual inspection of all electrical equipment, to check for the foreign material, tightness or wiring and connection, proper grounding, matching nameplate charts with specification, etc., prior to actual testing.
- F. After demonstration of systems, submit to the Architect 6 sets of keys for electrical equipment locks.

END OF SECTION

February 27, 2026

SECTION 16100 - ELECTRICAL WORK

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

As specified in SECTION 00700.

1.02 SUMMARY

Work includes power distribution, branch circuits, and wiring devices. Also includes testing and labeling.

1.03 APPLICABLE PUBLICATIONS

The publications cited within this specification form a part of this specification to the extent referenced. Unless otherwise indicated, most recent edition of the publication with current revisions and amendments will be enforced.

1.04 SUBMITTALS

- A. Submit in accordance with SECTION 01330 - SUBMITTAL PROCEDURES.
- B. Submit shop drawings and catalog cuts of the following equipment for approval. Each submittal prepared with a summary sheet attached to each copy individually identifying all items included in the submittal. Incomplete submittals and those without summary sheets will be returned without review.
 1. Panelboards.
 2. Overcurrent protection devices.
 3. Safety switches.
 4. Wiring Devices (light switches, receptacles) and sample of device plates.
 5. Large boxes and cabinets.
 6. Automatic control devices. (Time switches, lighting contactors, photocell, etc.)

PART 2 - PRODUCTS

2.01 GENERAL

- A. Materials shall be new and those items listed by the Underwriters' Laboratories shall bear "UL" label of approval.
- B. Brand names, manufacturer's names and catalog numbers indicate standard of design and quality required. Acceptable manufacturers for electrical apparatus include General Electric, Siemens, Square D, and Eaton. All apparatus supplied shall bear the name of the approved manufacturer on its nameplates. Substitute materials may be used if pre-qualified prior to bidding by the Architect.
- C. Electrical equipment and luminaires to be supplied through the manufacturer's designated representative by a local distributor.
- D. Furnish proof of compliance when shop drawings are submitted.
- E. All electrical apparatus of the same manufacturer unless otherwise noted.

February 27, 2026

- F. Where electrical apparatus is to be installed outdoors, NEMA 4X316SS housings shall be provided.2.02

2.02 RACEWAYS

- A. Rigid Steel Conduit: Rigid steel, galvanized, for use with threaded fittings. ANSI C80.1.
- B. Intermediate Metal Conduit (IMC): Rigid steel, galvanized, for use with threaded fittings. UL 1242.
- C. Electrical Metal Tubing (EMT): Thin walled steel tubing, zinc-coated. ANSI C80.1
- D. Flexible Metal Conduit: Flexible steel conduit; zinc-coated inside and outside, smooth inside walls, liquid-tight with factory fittings for liquid-tight installation. Provide bushings with bonding jumper lugs for flexible conduit in excess of 6 feet in length. UL 360.
- E. Flexible Polyethylene Jacketed Conduit: Liquid-tight steel, zinc-coated. U.V. stabilized high density polyethylene jacket, liquid-tight with factory fittings for exterior liquid-tight installation. Provide bushings with bonding jumper lugs for lengths in excess of 6 feet. UL 360.
- F. PVC Conduit: Polyvinyl chloride, Schedule 40 and 80. Provide a separate green equipment grounding conductor as noted on drawings.
- G. ENT: Electrical non-metallic tubing, for telecom raceway only.

2.03 BOXES

- A. Outlet and Small Junction Boxes: Nominal 4 inches square, 1-1/2 inch minimum depth exclusive of plaster ring, pressed steel, zinc-coated for corrosion protection. Exposed boxes and boxes exposed to the weather shall be cast aluminum, type FD,
- B. Extension Rings for Outlet Boxes: Pressed steel, zinc-coated for corrosion protection,
- C. Boxes Larger Than 4-11/16 inch Square: Fabricated from NEC grade steel, prime painted and finished to match adjacent architectural elements. NEMA 4X316SS as required.

2.04 CABINETS

- A. Fabricated from NEC grade steel with hinged door and lockable latch, galvanized for corrosion protection, finished to match panelboards, surface mounting and size as shown.
- B. Signal cabinets shall be equipped with 3/4-inch thick termite treated plywood backboards, painted white with fire resistant paint.
- C. All cabinets for power systems (i.e., panelboards, relay cabinets, etc.) shall be keyed alike. All cabinets for signal systems shall be keyed alike, but differently than power system cabinets.

2.05 CONDUCTORS

February 27, 2026

- A. Solid or stranded copper, sizes according to American Wire Gauge, wire as shown on Drawings and #12 AWG minimum unless otherwise indicated. Solid or stranded for #12 and #10. Stranded conductors only for #8 AWG and larger. All wiring shall be color coded.
- B. Branch Circuits: Type THWN.
- C. Luminaire Wires: Per NEC.
- D. Conductors Larger than #8 AWG: THWN or XHHW.
- E. Conductors for Equipment Connection: Stranded flexible type.

2.06 WIRING DEVICES

- A. Switches: Color as specified by Architect, 20A, 120/277V, AC only, non-mercury quiet type specification grade with nylon handle. Leviton #CS120 or accepted equivalent.
- B. Wall Box Dimmer Switches: Incandescent type, 120 volt, 60 hertz, UL listed, 600 watts minimum with slider lighting level control handle and on/off rocker switch. Dimmer shall utilize square law dimming with range zero to full intensity and shall contain a toroidal filter with non-magnetostrictive core for protection against radio frequency interference. Dimmer shall be voltage compensated. Ganged dimmers shall not have heat sink cooling fins broken off. Leviton #80800 or accepted equivalent. Dimmers shall be suitable for luminaires they are controlling down to 1% without flicker.
- C. Wall Box Dimming Sensor Switches: PIR and Microphonics technology to monitor a room for occupancy. Occupancy/Vacancy sensing, dimming, and manual-ON/auto-OFF requirements. Leviton ODDMT-M3W or accepted equivalent.
- D. Duplex Convenience Receptacles: Color by architect, 20A, 125V, specification grade, self-grounding type, unless otherwise noted in common areas. For hospital areas Leviton #8300-SGW, 20A hospital grade, tamper resistant outlets. Otherwise Leviton #T5320 or accepted equivalent. Color by architect.
- E. Other Receptacles: Specification grade, ratings and NEMA configurations as indicated.
- F. Ground Fault Circuit Interrupters: Receptacle type similar to duplex convenience receptacle except UL listed per UL 943 with 5 milliampere ground fault sensing circuit. Feed-through type with self-test and reset buttons. Leviton #8599 or accepted equivalent. Color by architect. For hospital areas, Leviton #7899 or accepted equivalent.

2.07 DEVICE PLATES

- A. Color as specified by Architect, heavy-duty screw type nylon or lexan plate for all devices. Gangs as required.
- B. For Exterior Use: Flip-open cover impact resistant, U.V. stabilized polycarbonate. Color to match adjacent finish. Cover capable of closing with a plug cap connected to the receptacle. Non-locking type. TayMac 20110 or accepted equivalent.

2.08 CONTROL EQUIPMENT

- A. Time Switch: Self-starting synchronous drive motor, an astronomic dial calibrated for 21 degrees north latitude, an electrically wound carry-over spring mechanism providing a minimum of 10 hours of operation during periods of power outages. Time switch shall be 2-pole with 120 volt timing motor, 60 cycles, with 40 ampere contacts. Provide manual type bypass switch and NEMA 1 enclosure. Timeswitch can also be part of lighting contactor cabinet similar to LC&D,
- B. Lighting Contactors: 20A contacts minimum or as indicated on Drawings, coil voltage as noted, NEMA 1 enclosure. Electrically and mechanically held, type as indicated on Drawings, Square D Class 8903, LC&D, or accepted equivalent.
- C. Safety Switches: Heavy duty, horsepower rated, quick-make, quick-break. NEMA 1 for indoor; NEMA 4X316SS for outdoor. Rejection fuse clips and RK-5 time delay fuses where noted.

2.09 PANELBOARDS

- A. Mounting, voltage rating, main bus capacity, AIC, breaker complement and lugs as specified on drawings, complete with housing, door, trim, lock and typewritten circuit directory. Provide ground bus for all panels.
- B. Panelboards bussing tin-plated aluminum with bolt-on, molded case circuit breakers. Provide one-inch-per-pole breakers, half-size breakers not allowed. Circuit breaker complement short circuit ratings shall be fully rated. Use of series rated equipment will be permitted only where indicated.
- C. All locks common-key type. Furnish 6 sets of keys to the Owner.
- D. Panel housing and entire circuit breaker complement of the same manufacture.
- E. Distribution panelboards minimum 30-inch wide, and 8-inch deep.

2.10 PANELBOARD CIRCUIT BREAKERS AND SAFETY SWITCHES

- A. Circuit breakers shall be molded case, toggle mechanism operated, with no-fuse ambient-compensated thermal-magnetic overload automatic trip units for overcurrent and short-circuit protection, and contacts rated to interrupt short-circuit currents as specified on Drawings. Multi-pole breakers shall have single, common operating handle for all poles.
- B. Safety switches heavy-duty grade, horsepower rated and sized as indicated or as to match branch circuit overcurrent device rating. Provide Class R rejection fuse clips for fusible units.
- C. Enclosures for breakers and switches to be NEMA 1 for interior locations. and NEMA 4X316SS for exterior locations.2.14

2.12 HARDWARE, SUPPORTS, BACKING, ETC.

- A. Provide all hardware, supports, backing and other accessories necessary to install electrical equipment. Wood materials shall be treated against termite, iron or steel materials shall be galvanized for corrosion protection, and non-ferrous materials shall be brass or bronze.
- B. Bolts, nuts, washers, and screws used for exterior shall be high quality 316 stainless steel or brass.

PART 3 - EXECUTION

3.01 GENERAL

- A. Install all electrical materials and equipment in accordance with manufacturer's recommendations and as approved by the Architect for the seismic zone 2 classification at the project site.
- B. Cut, break and drill as required, to install electrical system. Repair any surface damaged or marred by notching, drilling or any other process necessary for installation of electrical work. Patch any damaged surfaces to match the existing surface.
- C. All wiring and overcurrent devices for equipment furnished by other trades are sized for a contemplated equipment size. If equipment other than contemplated and indicated on the plan is provided, the Contractor shall be responsible for providing the required wiring, switches, and overcurrent devices at no cost to the Owner. Submit the proposed revisions to the electrical design to the Architect for approval.
- D. Coordinate work with other trades to avoid conflicts with mechanical, structural and architectural elements of this project.

3.02 RACEWAYS

- A. Use conduits with approved coupling and connectors. All cuts square, using saw. Ream the ends. Bends made with approved tools. Reject flattened or crushed conduit. No running thread. Bushing and 2 locknuts for rigid conduit at connection to boxes and enclosures. All raceways concealed where feasible.
- B. Seal against water during construction. Risers must be closed, except when pulling conductors.
- C. Exposed conduit runs to be parallel and/or perpendicular to architectural and structural elements. Galvanized rigid steel conduit or IMC up to 7'-0" above finished interior floor except in dedicated electric rooms. EMT permitted for exposed installation indoors above 7'-0". EMT also permitted for exposed installation throughout dedicated electrical rooms and back of house and utility areas (not subject to physical damage), except where routed up through grade slab.
- D. Electrical Metallic Tubing (EMT): Use only in dry furred spaces and walls above ground level except as noted above. Provide factory-made transition between rigid conduit and EMT. Use set screw type couplings in drywall and concrete tight couplings in slabs. Field-paint exposed tubing with corrosion-resistant paint. EMT with maximum size of one-inch permitted in elevated concrete slabs and walls with pre-approval from Structural Engineer.
- E. PVC Schedule 40 conduits only permitted for exterior duct lines and beneath grade slab at building; within retaining walls in contact with earth up to the first outlet box or conduit couplings above the height of earth being retained; and within walls anchored to grade slab and not in contact with earth anchored up to height of first outlet box or conduit coupling. Exposed installation of non-metallic conduit permitted in dedicated electric rooms. PVC schedule 80 for conduit supporting outlet and junction boxes.

February 27, 2026

- F. PVC Schedule 40 with maximum size of one-inch permitted in elevated concrete slabs and walls with pre-approval from Structural Engineer for telecom and CATV raceways only. PVC Schedule 40 with maximum size of 3/4-inch will be permitted in concrete walls, only where EMT cannot be used.
- G. Galvanized rigid steel conduit or IMC installed below grade shall be field wrapped with 0.01-inch thick pipe-wrapping plastic tape with a 50 percent overlay.
- H. Flexible polyethylene jacketed conduit for exposed installations only. Flexible metal conduit for interior installations only.
- J. Minimum conduit diameter shall be 3/4-inch trade size except that 1/2-inch conduit will be permitted for branch circuit raceways with a maximum of 4 current carrying conductors (2 phase – 2 neutrals) #10 AWG and smaller,
- K. Provide nylon pullstring of 200 pound minimum tensile strength in all empty conduits in excess of 15 feet in length.
- L. Conceal all raceways unless otherwise noted on the drawings.
- M. Conduits embedded in cast-in-place concrete slabs above grade shall be limited to 1-1/4 inch trade size with pre-approval from Structural Engineer. Maintain three-inch clear from post tension strands and other parallel conduits.
- N. Conduits crossing expansion joints shall be provided with appropriate couplings or flexible conduit jumpers as required to accommodate a 3/4-inch movement between structural elements in all horizontal directions from the static, design position.

3.03 BOXES

- A. Plumb and securely fasten. Flush boxes - exactly flush; apply form oil so that stray concrete can be removed readily. Remove all debris from interior.
- B. Install boxes serving opposite sides of party walls a minimum of 6-inches with putty pads and/or one stud space apart to minimize noise transmission.

3.04 CONDUCTORS

- A. Lubricants: Chemically neutral to insulation and sheath. Use manufacturer's recommended wire lubricant. Mechanical means for pulling to be torque-limiting type and not be used to #4 AWG and smaller wires.
- B. No-solder pressure wire-nut connectors for #10 AWG and smaller wires. For conductors #8 and larger, use AL/CU tap kits with plastic covers, ILSCO type GTA/PTA. Split-bolt taps not acceptable.
- C. Clean all raceways, boxes, and enclosures before pulling wires and cables. Form neatly in enclosures for minimum of cross-overs.

3.05 GROUNDING

- A. Ground all services, motors, metallic electrical enclosures and electrical equipment per Article 250 of the NEC. Provide ground conductor for metallic raceways.
- B. All receptacles grounded to metallic raceway system with green insulated pigtail in outlet box.

3.06 MISCELLANEOUS DETAILS

- A. Provide necessary foundations, supports, backing, etc., for all raceways and equipment. Attach to wood and steel by screws or bolts. Attach to concrete by expansion anchors. Powder charge driven studs and anchors shall not be used.
- B. Clean all surfaces of enclosures and equipment.
- C. Close all unused knockout holes.

3.07 PAINTING

- A. Wipe clean of dirt, oil, grease, etc., with rag and solvent, prime and finish to match surrounding finish. Do not paint over nameplate. Paint as specified in SECTION 09900 - PAINTING.
- B. Paint all surface-mounted boxes, enclosures, and exposed raceways to match the color of surrounding.
- C. Do not field-paint switchboard, circuit breakers, panelboards, contactors, time switches and/or safety switches.

3.08 IDENTIFICATION

- A. All overcurrent protection devices, enclosures, and cabinets shall be provided with plastic nameplate identifying itself and its use.
 - 1. Identify all panelboards, contactors, time switches, self-contained circuit breakers, and automatic transfer switch.
 - 2. Cabinets. (i.e., RELAY "2A").
 - 3. Junction boxes larger than 100 square inches.
 - 4. Safety switches 60 amperes and larger.
- B. Plastic nameplate shall be laminated black and white, engraved 1/4-inch high lettering to expose white layer. Identification plates for emergency system shall be laminated red and white plastic plate. Plate shall be riveted to the cover and located directly below device handle, or top side of door.
- C. CAUTION SIGNS shall be provided as required by Ordinances and/or by OSHA

3.09 TESTING

- A. Upon completion of this portion of work, and prior to its acceptance by the Owner, make all required tests and secure all required approval from agencies having jurisdiction. Any deficiencies found shall be rectified and work affected by such deficiencies shall be completely retested at Contractor's expense. Written notification of all proposed tests shall be provided to the Architect a minimum of 14 days prior to the date of the test.
- B. Perform an operational test after completion of the installation in the presence of the Architect, to assure proper operation of all items of work. Remove all grounds and shorts.
- C. Measure and record phase-to-phase and phase-to-neutral voltages at building service and furnish 3 copies of results to the Architect.

February 27, 2026

- D. Measure insulation resistances of all conductors, #1/0 AWG or larger, with a 500-volt megger, Biddle Company or equivalent. Record and furnish 3 copies of results to the Architect.
- E. Test 100 percent of receptacles for proper polarity, voltage and grounding continuity.
- F. Test smoke alarms for proper sensitivity, operation and common alarm.
- G. With all lighting loads energized, measure phase balance on panelboards. Reconnect branch circuits if phase unbalance exceeds 5 percent.

END OF SECTION

SECTION 16510 - LIGHTING

1.01 PART 1 - GENERAL

1.02 GENERAL CONDITIONS

As specified in SECTION 00700.

1.03 SUMMARY

Work includes providing light poles, mounting brackets, luminaires, lamps, and battery powered units. Materials not normally furnished by manufacturers of these devices are specified in SECTION 16100 - ELECTRICAL WORK.

1.04 APPLICABLE PUBLICATIONS

The publications listed within this specification form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only. Unless otherwise indicated, most recent edition of the publication with current revisions and amendments will be enforced.

1.05 SUBMITTALS

- A. Submit in accordance with SECTION 01330 - SUBMITTAL PROCEDURES.
- B. Data, shop drawings, and reports shall employ the terminology, classifications, and methods prescribed by the IES Lighting Handbook, as applicable, for the lighting system specified. Submit shop drawings and catalog cuts of the following equipment for approval. Prepare each submittal with a summary sheet attached to each copy individually identifying all items included in the submittal. Incomplete submittals and those without summary sheets will be returned without review.
 1. Manufacturer's Data
 - a. Luminaires.
 - b. Emergency lights.
 - c. Ballasts (input wattages, sound ratings, ballast factor, etc.)
 - d. LED drivers.
 2. Shop Drawings
 - a. Light poles.
 - b. Luminaire assemblies.

PART 2 - PRODUCTS

2.01 RECESS- AND FLUSH-MOUNTED LUMINAIRES

- A. Trim for the exposed surface of flush-mounted fixtures finished as indicated.
- B. Thermal protected with auto reset.
- C. Rated for insulated ceilings where applicable.
- D. Provide earthquake clips for luminaires recessed in grid ceilings.

2.02 SUSPENDED LUMINAIRES

Provide hangers capable of supporting twice the combined weight of the adjoining luminaires. Provide with swivel hangers to ensure a plumb installation with swivel-ball tapped for the conduit size indicated. Allow luminaires to swing within an angle of 45 degrees. Single-unit suspended linear luminaires shall have twin-stem hangers. Multiple-unit or continuous row luminaires shall have a tubing or stem for wiring at one point and a tubing or rod suspension provided for each unit length of chassis, including one at each end. Rods shall be a minimum 3/16-inch diameter.

2.03 EXIT SIGNS

UL 924, NFPA 70, and NFPA 101.

2.04 EMERGENCY UNIT LIGHTING EQUIPMENT

UL 924, NFPA 70, and NFPA 101.

1. Emergency: Provide as indicated. Units equipped with brown-out sensitive circuit to activate battery when ac input falls to 75 percent of normal voltage.
2. Batteries: Sealed maintenance-free lead calcium sized for 90 minutes of full operation. Provide low voltage disconnect.

PART 3 - EXECUTION

3.01 INSTALLATION

Set luminaires plumb, square, and level with ceiling and walls, in alignment with adjacent luminaires, unless otherwise indicated, and secure in accordance with manufacturers' directions and approved shop drawings. Meet with the requirements of NFPA 70. Verify the exact mounting before installation and, where applicable, after coordinating with the type, style, and pattern of the ceiling being installed. Recessed and semi-recessed luminaires may be supported from suspended ceiling support system ceiling tees if the ceiling system support rods or wires are provided at a minimum of four rods or wires per luminaire and located not more than six inches from each corner of each luminaire. Do not support fixtures by ceiling acoustical panels. Where luminaires of sizes less than the ceiling grid are indicated to be centered in the acoustical panel, support such luminaires independently or with at least one 3/4-inch metal channel spanning, and secured to the ceiling grids. Provide rods or wires for luminaire support under this section of the specifications. Rods or wires shall conform to the requirements of DIVISION 9 - FINISHES. Additionally, for recessed luminaires, provide support clips securely fastened to ceiling grid members, a minimum of one at or near each corner of each luminaire.

3.02 GROUNDING

Ground noncurrent-carrying parts of equipment as specified in SECTION 16100 - ELECTRICAL WORK. Where the copper grounding conductor is connected to a metal other than copper, provide specially treated or lined connectors suitable for this purpose.

February 27, 2026

3.03 **FIELD TESTS**

Upon completion of the installation, conduct an operating test to show that the equipment operates in accordance with the requirements of this section and as indicated on the Drawings.

END OF SECTION

SECTION 16711 - PATHWAYS FOR COMMUNICATIONS SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Metal conduits and fittings.
2. Optical-fiber-cable pathways and fittings.
3. Boxes, enclosures, and cabinets.

1.02 DEFINITIONS

- A. GRC: Galvanized rigid steel conduit.
- B. EMT: Electrical metallic tubing.

1.03 SUBMITTALS

- A. Submit in accordance with SECTION 01330 - SUBMITTAL PROCEDURES.
- B. Product Data: For surface pathways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.
- C. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, and attachment details.
- D. Coordination Drawings: Pathway routing plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of items involved:
 1. Structural members in paths of pathway groups with common supports.
 2. Architectural features in paths of conduit groups with common supports.

PART 2 - PRODUCTS

2.01 METAL CONDUITS AND FITTINGS

A. General Requirements

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. Comply with TIA-569-E.
- B. GRC: Comply with ANSI C80.1 and UL 6.
- C. EMT: Comply with ANSI C80.3 and UL 797.
- D. 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:
 - a. Material: Steel or die cast.
 - b. Type: Setscrew or compression.

3. Expansion Fittings: Steel to match conduit type, complying with UL-467, rated for environmental conditions where installed, and including flexible external bonding jumper.
- E. 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.

2.02 OPTICAL-FIBER-CABLE PATHWAYS AND FITTINGS

- A. Description: Comply with UL 2024; flexible-type pathway, approved for plenum riser or general-use installation unless otherwise indicated.
 1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 2. Comply with TIA-569-E.

2.03 BOXES, ENCLOSURES, AND CABINETS

- A. General Requirements
 1. Comply with TIA-569-E.
 2. 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. Box extensions used to accommodate new building finishes shall be of same material as recessed box.
- E. Metal Floor Boxes:
 1. Material: Cast metal or sheet metal.
 2. Type: Semi-adjustable.
 3. Shape: Rectangular.
 4. Listing and Labeling: Metal floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- F. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- G. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, cast aluminum with gasketed cover.
- 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.
- J. Nonmetallic Outlet and Device Boxes: Comply with NEMA OS 2 and UL 514C.
- K. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 1 with continuous-hinge cover with flush latch unless otherwise indicated.

1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
2. Nonmetallic Enclosures:
 - a. Material: Fiberglass.
 - b. Finished inside with radio-frequency-resistant paint.
3. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.

PART 3 - EXECUTION

3.01 PATHWAY APPLICATION

- A. Indoors: Apply pathway products as specified below unless otherwise indicated:
 1. Exposed, Not Subject to Physical Damage: EMT.
 2. Exposed, Not Subject to Severe Physical Damage: EMT.
 3. Exposed and Subject to Severe Physical Damage: GRC. Pathway locations include mechanical rooms.
 4. Concealed in Ceilings and Interior Walls and Partitions: EMT.
 5. Damp or Wet Locations: SSC
 6. Pathways for Optical-Fiber or Communications Cable in Spaces Used for Environmental Air: Plenum-type, communications-cable pathway.
 7. Pathways for Optical-Fiber or Communications-Cable Risers in Vertical Shafts: Riser-type, optical-fiber-cable pathway or Riser-type, communications-cable pathway EMT.
 8. Pathways for Concealed General-Purpose Distribution of Optical-Fiber or Communications Cable: General-use, optical-fiber-cable pathway, General-use, communications-cable pathway, EMT.
 9. Boxes and Enclosures: NEMA 250 Type 1, except use NEMA 250 Type 4X stainless steel damp or wet locations.
- B. Minimum Pathway Size: 3/4-inch (21-mm) trade size. Minimum size for optical-fiber cables is 1 inch (27 mm).
- C. Pathway Fittings: Compatible with pathways and suitable for use and location.
 1. Rigid Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
- D. Do not install aluminum conduits, boxes, or fittings.
- E. Install surface pathways only where indicated on Drawings.
- F. Do not install nonmetallic conduit.

3.02 INSTALLATION

- A. Comply with NECA 1, NECA 101, and TIA-569-B for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NFPA 70 limitations for types of pathways allowed in specific occupancies and number of floors.

- B. Keep pathways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal pathway runs above water and steam piping.
- C. Complete pathway installation before starting conductor installation.
- D. Comply with requirements in SECTION 16100 ELECTRICAL WORK for hangers and supports.
- E. Install no more than the equivalent of two 90-degree bends in any pathway run. Support within 12 inches of changes in direction. Utilize long radius ells for all optical-fiber cables. No section of conduit run shall be longer than 100ft between pull points.
- 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 of enclosures to which attached.
- H. Stub-ups to Above Recessed Ceilings:
 - 1. Use EMT or RMC for pathways.
 - 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 pathway and fittings before making up joints. Follow compound manufacturer's written instructions.
- J. Coat field-cut threads on GRC pathway with a corrosion-preventing conductive compound prior to assembly.
- K. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install insulated bushings on conduits terminated with locknuts.
- L. Install pathways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.
- M. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.
- N. Cut conduit perpendicular to the length. For conduits of 2-inch (53-mm) trade size and larger, use roll cutter or a guide to ensure cut is straight and perpendicular to the length.
- O. Install pull wires in empty pathways. 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.
- P. Pathways for Optical-Fiber and Communications Cable: Install pathways, metal and nonmetallic, rigid and flexible, as follows:
 - 1. 3/4-Inch (21-mm) Trade Size and Smaller: Install pathways in maximum lengths of 50 feet (15 m).
 - 2. 1-Inch (27-mm) Trade Size and Larger: Install pathways in maximum lengths of 75 feet (23 m).
 - 3. Install with a maximum of two 90-degree bends or equivalent for each length of pathway unless Drawings show stricter requirements. Separate

lengths with pull or junction boxes or terminations at distribution frames or cabinets where necessary to comply with these requirements.

- Q. Install pathway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed pathways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install pathway sealing fittings according to NFPA 70.
- R. Install devices to seal pathway 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 pathways at the following points:
 - 1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
 - 2. Where an underground service pathway enters a building or structure.
 - 3. Where otherwise required by NFPA 70.
- S. Comply with manufacturer's written instructions for solvent welding PVC conduit and fittings.
- T. Expansion-Joint Fittings:
 - 1. Install in each run of aboveground RMC and EMT conduit that is located where environmental temperature change may exceed 100 deg F and that has straight-run length that exceeds 100 feet.
 - 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 temperature change.
 - b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F temperature change.
 - c. Indoor Spaces Connected with Outdoors without Physical Separation: 125 deg F temperature change.
 - d. Attics: 135 deg F 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 deg F (0.06 mm per meter of length of straight run per deg C) of temperature change for PVC conduits. Install fitting(s) that provide expansion and contraction for at least 0.000078 inch per foot of length of straight run per deg F (0.0115 mm per meter of length of straight run per deg C) of temperature change for metal 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.
- U. 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.

- V. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surface to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box.
- W. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.
- X. 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.
- Y. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.
- Z. Set metal floor boxes level and flush with finished floor surface.
- AA. Set nonmetallic floor boxes level. Trim after installation to fit flush with finished floor surface.

3.03 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR COMMUNICATIONS PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies.

3.04 FIRESTOPPING

- A. Install firestopping at penetrations of fire-rated floor and wall assemblies.

3.05 PROTECTION

- A. Protect coatings, finishes, and cabinets from damage or deterioration.
- B. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.

END OF SECTION

February 27, 2026

SECTION 16717 - COMMUNICATION HORIZONTAL CABLING

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:

1. UTP cabling.
2. Single-mode, optical fiber cabling.
3. Category 6 cable.
4. Cable connecting hardware, patch panels, and cross-connects.
5. Telecommunications outlet/connectors.
6. Cabling system identification products.
7. Cable management system.

1.02 DEFINITIONS

- A. BICSI: Building Industry Consulting Service International.
- B. Cross-Connect: A facility enabling the termination of cable elements and their interconnection or cross-connection.
- C. EMI: Electromagnetic interference.
- D. IDC: Insulation displacement connector.
- E. LAN: Local area network.
- F. Outlet/Connectors: A connecting device in the work area on which horizontal cable or outlet cable terminates.
- G. RCDD: Registered Communications Distribution Designer.
- H. UTP: Unshielded twisted pair.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate layout and installation of telecommunications cabling with State's telecommunications and LAN equipment and service suppliers.
- B. Coordinate telecommunications outlet/connector locations with location of power receptacles at each video monitoring location.

1.04 SUBMITTALS

- A. Submit in accordance with SECTION 01330 - SUBMITTAL PROCEDURES.
- B. Product Data: For each type of product.
1. For each cable, include the following installation data for each type used:
 - a. Nominal OD.
 - b. Minimum bending radius.
 - c. Maximum pulling tension.

February 27, 2026

C. Shop Drawings:

1. System Labeling Schedules: Electronic copy of labeling schedules, in software and format selected by Contracting Officer.
2. Cabling administration drawings and printouts.
3. Wiring diagrams to show typical wiring schematics, including the following:
 - a. Cross-connects.
 - b. Patch panels.
 - c. Patch cords.
4. Cross-connects and patch panels. Detail mounting assemblies, and show elevations and physical relationship between the installed components.

D. Qualification Data: For qualified layout technician, installation supervisor, and field inspector.

E. Source quality-control reports.

F. Field quality-control reports.

G. Maintenance Data: For splices and connectors to include in maintenance manuals.

H. 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.

I. Maintenance Materials: Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Patch-Panel Units: One of each type.
2. Device Plates: One of each type.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Cabling Installer must have personnel certified by BICSI on staff.

1. Layout Responsibility: Preparation of shop drawings and cabling administration drawings, cabling by an RCDD.
2. Installation Supervision: Installation shall be under the direct supervision of Level 2 Installer, who shall be present at all times when Work of this Section is performed at Project site.
3. Testing Supervisor: Currently certified by BICSI as an RCDD to supervise on-site testing.

B. Testing Agency Qualifications: An NRTL.

February 27, 2026

1. Testing Agency's Field Supervisor: Currently certified by BICSI as an RCDD to supervise on-site testing.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Test cables upon receipt at Project site.

1. Test optical fiber cables to determine the continuity of the strand end to end. Use optical fiber flashlight or optical loss test set.
2. Test each fiber optic cable per ANSI/TIA-568.3-D. All fiber optic cabling links shall pass Tier 1 and Tier 2 test requirements.
3. Test optical fiber cables while on reels. Use an optical time domain reflectometer to verify the cable length and locate cable defects, splices, and connector; including the loss value of each. Retain test data and include the record in maintenance data.
4. Test each pair of UTP cable for open and short circuits.
5. Test each Cat 6 cabling permanent link per ANSI/TIA-568-C. All permanent cabling links shall pass the test requirements.

PART 2 - PRODUCTS

2.01 HORIZONTAL CABLING DESCRIPTION

- A. Horizontal cable and its connecting hardware provide the means of transporting signals between the telecommunications outlet/connector and the horizontal cross-connect located in the communications equipment room. This cabling and its connecting hardware are called a "permanent link," a term that is used in the testing protocols.
 1. TIA/EIA-568-B.1 requires that a minimum of two telecommunications outlet/connectors be installed for each work area.
 2. Horizontal cabling shall contain no more than one transition point or consolidation point between the horizontal cross-connect and the telecommunications outlet/connector.
 3. Bridged taps and splices shall not be installed in the horizontal cabling.
 4. Splitters shall not be installed as part of the optical fiber cabling.
- B. A work area is approximately 100 sq. ft. (9.3 sq. m), and includes the components that extend from the telecommunications outlet/connectors to the station equipment.
- C. 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.

2.02 PERFORMANCE REQUIREMENTS

- A. General Performance: Horizontal cabling system shall comply with transmission standards in TIA/EIA-568-B.1 when tested according to test procedures of this standard.

February 27, 2026

- B. Surface-Burning Characteristics: Comply with ASTM E 84; 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: 450 or less.
- C. 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.
- D. Grounding: Comply with J-STD-607-A.

2.03 BACKBOARDS

- A. Backboards: AC grade plywood, fire-retardant treated, 3/4 by 48 by 96 inches (19 by 1220 by 2440 mm). Void free.

2.04 UTP CABLE

- A. Description: 100-ohm, four-pair UTP, formed into 25-pair, binder groups covered with a blue thermoplastic jacket.
 - 1. Comply with ICEA S-90-661 for mechanical properties.
 - 2. Comply with TIA/EIA-568-B.1 for performance specifications.
 - 3. Comply with TIA/EIA-568-B.2, Category 6.
 - 4. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444 and NFPA 70 for the following types:
 - a. Communications, Riser Rated: Type CMR; CMP, complying with UL 1666.

2.05 UTP CABLE HARDWARE

- A. General Requirements for Cable Connecting Hardware: Comply with TIA/EIA-568-B.2, IDC type, with modules designed for punch-down caps or tools. Cables shall be terminated with connecting hardware of same category or higher.
- B. Connecting Blocks: 110-style IDC for Category 6. 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.
- C. 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.
- D. Patch Panel: Modular panels housing multiple-numbered jack units with IDC-type connectors at each jack for permanent termination of pair groups of installed cables.
 - 1. Number of Jacks per Field: One for each four-pair conductor group of indicated cables, plus spares and blank positions adequate to suit specified expansion criteria.

February 27, 2026

- E. Jacks and Jack Assemblies: Modular, color-coded, eight-position modular receptacle units with integral IDC-type terminals. Terminate jacks per T568B wiring diagram.
- F. Patch Cords: Factory-made, four-pair cables in 36-inch (900 mm) lengths; terminated with eight-position modular plug at each end.
 - 1. Patch cords shall have bend-relief-compliant boots and color-coded icons to ensure Category 6 performance. Patch cords shall have latch guards to protect against snagging.
 - 2. Patch cords shall have color-coded boots for circuit identification.

2.06 OPTICAL FIBER CABLE

- A. Description: Single-mode, 9/125-micrometer, 2-fiber, nonconductive, tight buffer, optical fiber cable, indoor rated.
 - 1. Comply with ICEA S-83-596 for mechanical properties.
 - 2. Comply with TIA/EIA-568-B.3 for performance specifications.
 - 3. Comply with TIA/EIA-492CAAA for detailed specifications.
 - 4. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444, UL 1651, and NFPA 70 for the following types:
 - a. General Purpose, Nonconductive: Type OFN or OFNG, or OFNR, OFNP.
 - b. Plenum Rated, Nonconductive: Type OFNP, complying with NFPA 262.
 - c. Riser Rated, Nonconductive: Type OFNR or OFNP, complying with UL 1666.
 - 5. Maximum Attenuation: 0.5 dB/km at 1300 nm.
- B. Jacket:
 - 1. Cable cordage jacket, fiber, unit, and group color shall be according to TIA-598-C.
 - 2. Imprinted with fiber count, fiber type, and aggregate length at regular intervals not to exceed 40 inches (1000 mm).

2.07 OPTICAL FIBER CABLE HARDWARE

- A. Cross-Connects and Patch Panels: Modular panels housing multiple-numbered, duplex cable connectors.
 - 1. Number of Connectors per Field: One for each fiber of cable or cables assigned to field, plus spares and blank positions adequate to suit specified expansion criteria.
- B. Patch Cords: Factory-made, dual-fiber cables in 36-inch (900-mm) lengths.
- C. Cable Connecting Hardware:
 - 1. Comply with Optical Fiber Connector Intermateability Standards (FOCIS) specifications of TIA-604-2-B, TIA-604-3-B, and TIA/EIA-604-12. Comply with TIA/EIA-568-B.3.

February 27, 2026

2. Quick-connect, simplex and duplex, Type LC connectors. Insertion loss not more than 0.75 dB.

2.08 HDMI CABLE

- A. Cable Characteristics: HDMI 2.1, 48.0 Gb/s as recommended by video monitor manufacturer.
- B. Type A connector.

2.09 TELECOMMUNICATIONS OUTLET/CONNECTORS

- A. Jacks: 100-ohm, balanced, twisted-pair connector; four-pair, eight-position modular. Comply with TIA/EIA-568-B.1.
- B. Workstation Outlets: Two-port-connector assemblies mounted in single faceplate.
 1. Plastic Faceplate: High-impact plastic.
 2. For use with snap-in jacks accommodating any combination of UTP, optical fiber, and HDMI work area cords.
 - a. Flush mounting jacks, positioning the cord at a 45-degree angle.
 3. Legend: Factory labeled by silk-screening or engraving for stainless steel faceplates.
 4. Legend: Machine printed, in the field, using adhesive-tape label.
 5. Legend: Snap-in, clear-label covers and machine-printed paper inserts.

2.10 GROUNDING

- A. Comply with requirements for grounding conductors and connectors.
- B. Comply with J-STD-607-A.

2.11 IDENTIFICATION PRODUCTS

- A. Comply with TIA/EIA-606-A and UL 969 for labeling materials, including label stocks, laminating adhesives, and inks used by label printers.

2.12 SOURCE QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to evaluate cables.
- B. Factory test UTP and optical fiber cables on reels according to TIA/EIA-568-B.1.
- C. Factory test UTP cables according to TIA/EIA-568-B.2.
- D. Factory test optical fiber cables according to TIA-568-C and TIA/EIA-568-B.3.
- E. Cable will be considered defective if it does not pass tests and inspections.
- F. Prepare test and inspection reports.

3.01 WIRING METHODS

- A. Install cables in metallic conduit pathways. Conceal pathways and cables except in unfinished spaces.
 - 1. Comply with requirements in SECTION 16711 - PATHWAYS FOR COMMUNICATIONS SYSTEMS.
- B. Conceal conduits and cables in accessible ceilings, walls, and floors where possible.
- C. Wiring within Enclosures:
 - 1. Bundle, lace, and train conductors to terminal points with no excess and without exceeding manufacturer's limitations on bending radii.
 - 2. Install lacing bars and distribution spools.
 - 3. Install conductors parallel with or at right angles to sides and back of enclosure.

3.02 INSTALLATION OF CABLES

- A. Comply with NECA 1.
- B. General Requirements for Cabling:
 - 1. Comply with TIA/EIA-568-B.1.
 - 2. Comply with BICSI ITSIM, 8th edition Ch. 6, "Cable Termination Practices."
 - 3. Install 110-style IDC termination hardware unless otherwise indicated.
 - 4. Terminate conductors; no cable shall contain unterminated elements. Make terminations only at indicated outlets and patch panels.
 - 5. Cables may not be spliced. Secure and support cables at intervals not exceeding 30 inches and not more than 6 inches from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
 - 6. Install lacing bars to restrain cables, to prevent straining connections, and to prevent bending cables to smaller radii than minimums recommended by manufacturer.
 - 7. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI ITSIM, "Cabling Termination Practices" Chapter. Install lacing bars and distribution spools.
 - 8. 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.
 - 9. Cold-Weather Installation: Bring cable to room temperature before dereeling. Heat lamps shall not be used for heating.
 - 10. In the communications equipment room, install a 10-foot- long service loop on each end of cable.

February 27, 2026

11. Pulling Cable: Comply with BICSI ITSIIM, Ch. 4, "Pulling Cable." Monitor cable pull tensions.
- C. UTP Cable Installation:
 1. Comply with TIA/EIA-526-7.
 2. Do not untwist UTP cables more than 1/2 inch from the point of termination to maintain cable geometry.
- D. Optical Fiber Cable Installation:
 1. Comply with TIA/EIA-568-B.3.
 2. Cable may be terminated on connecting hardware that is rack or cabinet mounted.
- E. Open-Cable Installation:
 1. Install cabling with horizontal and vertical cable guides in telecommunications spaces with terminating hardware and interconnection equipment.
 2. Suspend UTP cable not in a wireway or pathway a minimum of 8 inches above ceilings by cable supports not more than 60 inches apart.
 3. Cable shall not be run through structural members or in contact with pipes, ducts, or other potentially damaging items.
- F. Group connecting hardware for cables into separate logical fields.
- G. Separation from EMI Sources:
 1. Comply with BICSI TDMM and TIA-569-B for separating unshielded copper voice and data communication cable from potential EMI sources, including electrical power lines and equipment.
 2. Separation between open communications cables or cables in nonmetallic raceways and unshielded power conductors and electrical equipment shall be as follows:
 - a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 5 inches (127 mm).
 - b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 12 inches (300 mm).
 - c. Electrical Equipment Rating More Than 5 kVA: A minimum of 24 inches (610 mm).
 3. Separation between communications cables in grounded metallic raceways and unshielded power lines or electrical equipment shall be as follows:
 - a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 2-1/2 inches (64 mm).
 - b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 6 inches (150 mm).
 - c. Electrical Equipment Rating More Than 5 kVA: A minimum of 12 inches (300 mm).

February 27, 2026

4. Separation between communications cables in grounded metallic raceways and power lines and electrical equipment located in grounded metallic conduits or enclosures shall be as follows:
 - a. Electrical Equipment Rating Less Than 2 kVA: No requirement.
 - b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 3 inches (76 mm).
 - c. Electrical Equipment Rating More Than 5 kVA: A minimum of 6 inches (150 mm).
5. Separation between Communications Cables and Electrical Motors and Transformers, 5 kVA or HP and Larger: A minimum of 48 inches.
6. Separation between Communications Cables and Fluorescent Fixtures: A minimum of 5 inches.

3.03 FIRESTOPPING

- A. Comply with TIA-569-B, Annex A, "Firestopping."
- B. Comply with BICSI TDMM, "Firestopping Systems" Article.

3.04 GROUNDING

- A. Install grounding according to BICSI TDMM, "Grounding, Bonding, and Electrical Protection" Chapter.
- B. Comply with J-STD-607-A.
- C. Locate grounding bus bar to minimize the length of bonding conductors. Fasten to wall allowing at least 2-inch (50-mm) clearance behind the grounding bus bar. Connect grounding bus bar with a minimum No. 4 AWG grounding electrode conductor from grounding bus bar to suitable electrical building ground.
- D. Bond metallic equipment to the grounding bus bar, using not smaller than No. 6 AWG equipment grounding conductor.

3.05 IDENTIFICATION

- A. Identify system components, wiring, and cabling complying with TIA/EIA-606-A. Comply with requirements for identification specified in Section 16100 - Electrical Work.
- B. Using cable management system software specified in Part 2, develop Cabling Administration Drawings for system identification, testing, and management. Use unique, alphanumeric designation for each cable and label cable, jacks, connectors, and terminals to which it connects with same designation. At completion, cable and asset management software shall reflect as-built conditions.
- C. For fire-resistant plywood, do not paint over manufacturer's label.
- D. Paint and label colors for equipment identification shall comply with TIA/EIA-606-A for Class 3 level of administration, including optional identification requirements of this standard.

February 27, 2026

- E. Cable Schedule: Post in prominent location in each equipment room and wiring closet. List incoming and outgoing cables and their designations, origins, and destinations. Protect with rigid frame and clear plastic cover. Furnish an electronic copy of final comprehensive schedules for Project.
- F. Cabling Administration Drawings: Show building floor plans with cabling administration-point labeling. Identify labeling convention and show labels for telecommunications closets, backbone pathways and cables, entrance pathways and cables, terminal hardware and positions, horizontal cables, work areas and workstation terminal positions, grounding buses and pathways, and equipment grounding conductors. Follow convention of TIA/EIA-606-A. Furnish electronic record of all drawings, in software and format selected by Contracting Officer.
- G. Cable and Wire Identification:
 - 1. Label each cable within 4 inches 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 device if color of wire 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. 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 being extended from a panel or cabinet to a building-mounted device shall be identified with name and number of particular device as shown.
 - 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.
- H. Labels shall be preprinted or computer-printed type with printing area and font color that contrasts with cable jacket color but still complies with requirements in TIA/EIA-606-A.
 - 1. Cables use flexible vinyl or polyester that flex as cables are bent.

3.06 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- C. Perform the following tests and inspections:

February 27, 2026

1. Visually inspect UTP and optical fiber cable 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/EIA-568-B.1.
2. Visually confirm Category 6, marking of outlets, cover plates, outlet/connectors, and patch panels.
3. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.
4. Test UTP copper 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.
 - a. Test instruments shall meet or exceed applicable requirements in TIA/EIA-568-B.2. Perform tests with a tester that complies with performance requirements in "Test Instruments (Normative)" Annex, complying with measurement accuracy specified in "Measurement Accuracy (Informative)" Annex. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.
5. Optical Fiber Cable Tests:
 - a. Test instruments shall meet or exceed applicable requirements in TIA/EIA-568-B.1. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.
 - b. Perform Optic Fiber end-to-end attenuation tests in accordance with TIA/EIA-568-C.3 and TIA/EIA-526-7 using Method A, Optical Power Meter and Light Source for single-mode fiber.
6. UTP Performance Tests:
 - a. Test for each outlet. Perform the following tests according to TIA/EIA-568-B.1 and TIA/EIA-568-B.2:
 - 1) Wire map.
 - 2) Length (physical vs. electrical, and length requirements).
 - 3) Insertion loss.
 - 4) Near-end crosstalk (NEXT) loss.
 - 5) Power sum near-end crosstalk (PSNEXT) loss.
 - 6) Equal-level far-end crosstalk (ELFEXT).
 - 7) Power sum equal-level far-end crosstalk (PSELFEXT).
 - 8) Return loss.
 - 9) Propagation delay.
 - 10) Delay skew.
7. Optical Fiber Cable Performance Tests: Perform optical fiber end-to-end link tests according to TIA/EIA-568-B.1 and TIA/EIA-568-B.3.

February 27, 2026

8. Final Verification Tests: Perform verification tests for UTP and optical fiber systems after the complete communications cabling and workstation outlet/connectors are installed.
- D. Document data for each measurement. Data for submittals shall be printed in a summary report that is formatted similar to Table 10.1 in BICSI TDMM, or transferred from the instrument to the computer, saved as text files, and printed and submitted.
- E. End-to-end cabling will be considered defective if it does not pass tests and inspections.
- F. Prepare test and inspection reports.

3.07 SOFTWARE SERVICE AGREEMENT

- A. Technical Support: Beginning with Substantial Completion, provide software support for two years.
- B. Upgrade Service: Update software to latest version at Project completion. Install and program software upgrades that become available within two years from date of Substantial Completion. Upgrading software shall include operating system. Upgrade shall include new or revised licenses for use of software.
 1. Provide 30 days' notice to Contracting Officer to allow scheduling and access to system and to allow State to upgrade computer equipment if necessary.

3.08 DEMONSTRATION

- A. Train State's maintenance personnel in cable-plant management operations, including changing signal pathways for different workstations, rerouting signals in failed cables, and keeping records of cabling assignments and revisions when extending wiring to establish new CCTV and video monitoring area outlets.

END OF SECTION