



**FLORIDA A&M UNIVERSITY
RATTLER POINT WASH HOUSE
BUILD-OUT**

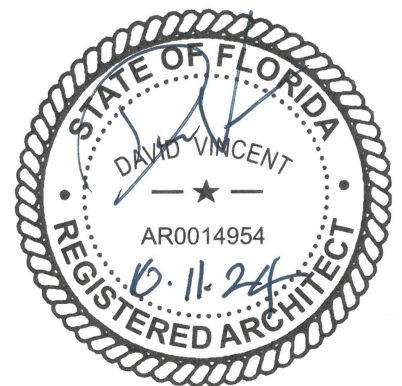
CONSTRUCTION DOCUMENTS

September 13, 2024

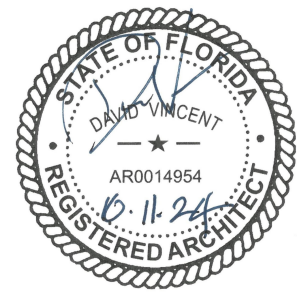
JRA Commission Number - 24852

**JRA ARCHITECTS, INC.
2551 Blirstone Pines Drive
Tallahassee, Fl. 32301**

(850) 878-7891 - Phone

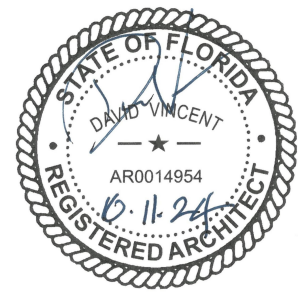


**FLORIDA A&M UNIVERSITY
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SEPTEMBER 13, 2024**



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Section 08 43 13	Aluminum-Framed Storefronts and Windows
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Section 10 52 30	Fire Extinguishers
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Specifications for Mechanical, Electrical, Plumbing and Data/Com are included in the drawings.

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SECTION 00 07 00 - GENERAL CONDITIONS

PART 1 - STANDARD GENERAL CONDITIONS

- A. The "General Conditions of the Contract for Construction" of the American Institute of Architects, AIA Document No. A201-2017, are an integral part of the Specifications as if written in full herein.
- B. Copies of the "General Conditions" are on file and may be examined in the office of the Architect, or may be purchased from the Florida Association, The American Institute of Architects, Document Department, P.O. Box 10388, Tallahassee, Florida, 32302.
- C. The Contractor is hereby specifically directed, as a condition of the Contract, to obtain the necessary number of copies of Document A201, to acquaint himself with the Articles contained therein and to notify and appraise all Subcontractors, Suppliers and any other parties of the Contract or individuals or agencies engaged in the work as to its contents.
- D. No contractual adjustments shall be due or become exigent as a result of, or failure on the part of the Contractor to fully acquaint himself and all other parties to the contract with the conditions of Document A201.
- E. Contractor will be required to comply with 2 CFR – Contract Provision for Non-Federal Entity under Federal Awards.

END OF SECTION 00 07 00

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DOCUMENT 00 43 23 - ALTERNATES FORM

1.1 BID INFORMATION

- A. Bidder:
_____.
- B. Project Name: Florida A&M University Rattler Point Wash House Build-Out
- C. Project Location: Campus of Florida A&M University
- D. Owner: Florida A&M University
- E. Architect: JRA Architects
- F. Architect Project Number: 24852

1.2 BID FORM SUPPLEMENT

- A. This form is required to be attached to the Bid Form.

1.3 DESCRIPTION

- A. The undersigned Bidder proposes the amount below be added to or deducted from the Base Bid if particular alternates are accepted by Owner. Amounts listed for each alternate include costs of related coordination, modification, or adjustment.
- B. If the alternate does not affect the Contract Sum, the Bidder shall indicate "NO CHANGE."
- C. If the alternate does not affect the Work of this Contract, the Bidder shall indicate "NOT APPLICABLE."
- D. The Bidder shall be responsible for determining from the Contract Documents the effects of each alternate on the Contract Time and the Contract Sum.
- E. Owner reserves the right to accept or reject any alternate, in any order, and to award or amend the Contract accordingly within 60 days of the Notice of Award unless otherwise indicated in the Contract Documents.
- F. Acceptance or non-acceptance of any alternates by the Owner shall have no effect on the Contract Time unless the "Schedule of Alternates" Article below provides a formatted space for the adjustment of the Contract Time.

1.4 SCHEDULE OF ALTERNATES

A. Alternate No. 1: [Replace existing shingle roof, underlayment, eave and rake trim, and 10% of plywood decking.]

1. _____ Dollars
(\$_____).

2. ADD____DEDUCT____(____) calendar days to adjust the Contract Time for this alternate.

1.5 SUBMISSION OF BID SUPPLEMENT

A. Respectfully submitted this ____ day of _____, 2024.

B. Submitted By: _____
(Insert name of bidding firm or corporation).

C. Authorized Signature: _____
(Handwritten Signature)

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

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

END OF DOCUMENT 00 43 23

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SECTION 00 84 20 - SAFETY REQUIREMENTS

PART 1 - GENERAL

1.1 OSHA REGULATIONS:

- A. It is the responsibility of the Contractor to ensure that all OSHA regulations applying to this job are adhered to at all times.

1.2 FLORIDA RIGHT-TO KNOW LAW:

- A. Florida Statutes, as applicable to the work required to fulfill the Contractor's obligations under this contract. These requirements include, but are not necessarily limited to, the following: It is the responsibility of the Contractor to comply with the requirements of Chapter 442,

1. That if the work requires the direct purchase of any item designated as a toxic substance, the manufacturer, importer, or distributor of said toxic substance shall prepare and provide the purchaser (Contractor) with a Material Safety Data Sheet (MSDS) that is current, accurate, and complete.
2. That every employer (Contractor) who manufactures, produces, uses, applies, or stores toxic substances in the workplace shall in a place where notices are normally posted post a notice informing employees of their rights under this statute.
3. That every employer (Contractor) who manufactures, produces, uses, or applies toxic substances in the workplace shall maintain an MSDS for each product which is present in such workplace.
4. That an independent contractor (Contractor) or subcontractor working in the workplace of another employer (Owner) may request in writing and shall have the right to examine the MSDS for the toxic substances to which he/she or his/her employees, are, have been, or may be exposed.
 - a. A toxic substance is defined as any chemical substance or mixture in gaseous, liquid or solid state, if such substance appears on the "Florida Substance List" promulgated by the Department of Labor and Employment Security; is manufactured, produced, used, applied or stored in the workplace; and causes a significant risk to safety or health during, or as a proximate result of, any customary or reasonably foreseeable handling or use.

- B. Any questions regarding the above requirements should be directed to: Department of

Labor and Employment Security, Bureau of Industrial Safety and Health, Toxic Waste Information Center, 2551 Executive Center Circle West, Tallahassee, FL 32301-5014, Telephone: 1-800-367-4378.

- C. The MSDS must be maintained by the user agency and must include the following information:
1. The Chemical name and the common name of the toxic substance.
 2. The hazards or other risks in the use of the toxic substance, including:
 - a. The potential for fire, explosion, corrosion, and reactivity.
 - b. The known acute and chronic health effects of risks from exposure, including the medical conditions which are generally recognized as being aggravated by exposure to the toxic substance;
 - c. The primary routes of entry and symptoms of overexposure.
 3. The proper precautions, handling practices, necessary personal protective equipment, and other safety precautions in the use of or exposure to the toxic substances, including appropriate emergency treatment in case of overexposure.
 4. The emergency procedure for spills, fire, disposal, and first aid.
 5. A description in lay terms of the known specific potential health risks posed by the toxic substance intended to alert any person reading this information.
 6. The year and month, if available, that the information was compiled and the name, address, and emergency telephone number of the manufacturer responsible for preparing the information.

1.3 EXCAVATIONS AND TRENCHES:

- A. Excavations and trenches shall comply with the Trench Safety Act, Chapter 553, part VI, Florida Statutes.

END OF SECTION 00 84 20

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SECTION 01 00 00 - SUMMARY

PART 1 - GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

- A. Project Identification: Project consists of renovation of a single story CMU and brick structure approximately 1,200 square feet in size.
 - 1. Project Location: Tallahassee, Florida
 - 2. Owner: Florida A & M University
- B. Architect Identification: The Construction Documents, dated 9/13/24, were prepared for Project by JRA Architects, Inc., 2551 Blairstone Pines Drive, Tallahassee, Florida.
- C. Owner's Project Coordinator: Bodie Young is to serve as Project Coordinator.
- D. The Work:
 - 1. Demolition of existing interior finishes and walks.
 - 2. Construct new student commons area.
 - 3. Construct new shingle roof on existing substrate and roof trusses.

1.2 CONTRACT

- A. Project will be constructed under single contract.

1.3 WORK SEQUENCE

- A. The Work shall be conducted in one phase.

1.4 USE OF PREMISES

- A. General: Contractor shall have full use of Project Site, during construction period.

1.5 WORK UNDER OTHER CONTRACTS (Non-Applicable)

1.6 FUTURE WORK (Non-Applicable)

1.7 PRODUCTS ORDERED IN ADVANCE (Non-Applicable)

1.8 OWNER-FURNISHED PRODUCTS (Non-Applicable)

1.9 SPECIFICATION FORMATS AND CONVENTIONS

A. Specification Format: The Specifications are organized into Divisions and Sections using the "MasterSpec Format" numbering system.

1. Section Identification: The Specifications use section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of sections in the Contract Documents.

B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.

2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.

a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

1.10 MISCELLANEOUS PROVISIONS

A. Thru-out this document the terms GC (General Contractor) and CM (Construction Manager) shall be used interchangeable and shall be used to identify the Primary contract holder for construction.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 Complete project on schedule and in accordance with Contract Documents.

END OF SECTION 01 00 00

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SECTION 01 01 20 - BUILDING PERMIT

PART 1 - GENERAL

1.1 REQUIREMENTS:

- A. The general contractor shall apply FAMU's office of Environmental Health and Safety for a building permit. At the time of application for a permit, the General Contractor shall provide two sets of construction documents and specifications, or an electronic set of construction documents and specifications, a list of all subcontractors that will include appropriate license numbers. A building permit will be issued after the State Fire Marshall has approved the plans and these items have been reviewed and approved by the Building Code Administrator.

- B. The GC shall meet with the Building Code Administrator to develop a building inspection plan. The GC shall be responsible for scheduling all required inspections in accordance with the plan developed. Subsequent construction may not proceed until the previous inspection has been completed and approved. When the GC believes the project is complete, the GC shall request a certificate of completion or certificate of occupancy be issues.

END OF SECTION 01 01 20

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SECTION 01 01 50 - CONTRACTOR'S USE OF THE PREMISES

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK INCLUDED:

This Section applies to situations in which the Contractor or his representatives including, but not necessarily limited to, suppliers, subcontractors, employees, and field engineers, enter upon the Owner's property.

1.2 QUALITY ASSURANCE:

- A. Promptly upon award of the Contract, notify all pertinent personnel regarding requirements of this Section.
- B. Require that all personnel who will enter upon the University's property certify their awareness of and familiarity with the requirements of this Section.

1.3 TRANSPORTATION FACILITIES:

- A. Provide adequate protection for curbs and sidewalks over which trucks and equipment pass to reach the job site.

1.4 DELIVERIES

- A. Deliveries/Unloading - Subcontractor will provide all necessary equipment, manpower and rigging to safely and efficiently unload its materials in areas assigned or approved by contractor. Material delivery times will be coordinated with suppliers and approved by contractor so as not to impede or disrupt the work or schedule of contractor or other Subcontractors. All materials delivered to the project will be properly tagged, labeled and/or marked with the appropriate building and room number to match the designations indicated on the contract documents

1.5 SECURITY:

- A. Restrict the access of all persons entering upon the Owner's property in connection with the Work to the Access Route and to the actual site of the Work.
- B. The Contractor shall at all times guard against damage or loss to the property of the University or other vendors or contractors and shall be held responsible for replacing or repairing any such loss or damage. The University may withhold payment or make such

deductions as deemed necessary to insure reimbursement or replacement for loss or damaged property through negligence of the successful bidder or his agents. Replace any trees, shrubs, lawns, or plantings damaged by Contractor during work of this project within two (2) weeks of occurrence. Grassed areas generally have irrigation systems below grade; verify location of these systems and all underground utilities in work or staging areas prior to start of construction. Repair utilities damaged by work of this project.

- C. The Contractor shall keep the premises free from accumulation of waste material and rubbish, and shall remove from the premises all rubbish, implements, surplus materials, and temporary facilities provided by him during the course of his work and leave spaces involved broom clean.
- D. Any welding operations shall have shields provided by the Contractor as required to protect the public from such welding.

1.6 SPECIFIC POLICE DEPARTMENT REQUIREMENTS:

The following list of requirements are to be met by Construction Companies, Contractors and their employees, while they are engaged in construction projects at the FAMU. Any Construction Site located on the FAMU Campus comes under the jurisdiction of the FAMU Police Department. Any incident requiring police service should be reported to the University Police Department at (850) 599-3256 immediately.

- A. All employers are prohibited from allowing employees to work on campus who have been convicted of violent crimes.
- B. Construction employers will not knowingly allow person(s) who currently have outstanding criminal warrants to work on campus.
- C. All contractors who employ Work Release persons as employees are to furnish the University Police Department with all names of such persons employed under the Work Release Program.
- D. Contractors and employees are to obey all laws, as well as the rules of the FAMU when they are on University property.
- E. Construction companies and employees are required to secure all property as much as feasible to reduce theft or damage to equipment or property.

1.7 TEMPORARY UTILITIES:

- A. If any utilities are required which are not already readily available at the construction site, the Contractor shall pay for the temporary installation of such utilities and a monthly charge, as determined by usage.

END OF SECTION 01 01 50

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SECTION 01 02 10 – ALLOWANCES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes;
 - 1. Schedule of allowances.
 - 2. Selection of products.
 - 3. Adjustment of costs.

1.2 ALLOWANCES FOR PRODUCTS

- A. The amount of each allowance shall include:
 - 1. The cost of the Product to the Contractor.
 - 2. Delivery to the site.
 - 3. Applicable taxes.
 - 4. Handling at the site.
 - 5. Protection.
 - 6. Labor.
 - 7. Contractor's and Subcontractor's overhead and profit.
 - 8. Other expenses required to complete the installation.

1.3 SELECTION OF PRODUCTS UNDER ALLOWANCES

- A. Contractor's Duties:
 - 1. Assist Owner in determining qualified suppliers or installers.
 - 2. Obtain proposals from suppliers and installers.
 - 3. Make appropriate recommendations.

1.4 ADJUSTMENT OF COSTS

- A. Should the net cost be more than the specified amount of the allowance, the Contract Sum will be adjusted accordingly by Change Order.
 - 1. The amount of the Change Order will recognize:
 - a. Any changes in handling costs at the site.
 - b. Labor.
 - c. Installation costs.
 - d. Overhead and profit.
 - e. Other expenses caused by the selection under the allowance.

- B. Submit any claims for anticipated additional costs at the site.
- C. At contract close-out, reflect all approved changes in contract amounts in the final statement of accounting.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION

3.1 SCHEDULE OF ALLOWANCES

- A. Hardware Allowance – Purchase and install door hardware - \$6,000.00
- B. Slab Stabilization – Stabilize Existing - \$10,000.00
Concrete Slab at SW corner of building.
Repoint brick and repair grout as needed.

END OF SECTION 01 02 10

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SECTION 01 02 70 - APPLICATIONS FOR PAYMENT

The contractor shall submit partial payment applications through the A/E. The contractor shall use AIA Documents G 702 & G 703.

END OF SECTION 01 02 70

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SECTION 01 04 00 - COORDINATION

PART 1 - GENERAL:

1. WORK INCLUDED

- A. Contractor shall supervise and direct the work competently and efficiently, devoting such attention thereto and applying such skills as may be necessary to perform the work in accordance with the Contract Documents.
- B. Contractor shall be solely responsible for all means, methods, techniques, sequences and procedures of construction, and for providing adequate safety precautions and coordinating all portions of the work under the Contract Documents.
- C. Contractor shall be responsible to see that the finished work complies accurately with the Contract Documents.

2. DESCRIPTION

- A. Coordinate scheduling, submittals, and work of the various sections of specifications to assure efficient and orderly sequence of installation of construction elements, with provisions for accommodating items to be installed later.
 - 1. Maintain reports and records at job site:
 - a. Daily log of progress of work and other pertinent data. Maintain log accessible to Owner, Architect and his representatives.
 - b. Assemble documentation for handling of any claims or disputes which may arise.
 - 2. Inspections and Testing:
 - a. Inspect the work to assure that it is performed in accordance with the requirements of the Contract Documents.
 - b. Arrange for special inspections and testing required by Sections of the specifications.

- c. Reject work which does not conform to requirements of the Contract Documents.
- B. Coordinate sequence of work to insure proposed completion dates are met.
 - 1. Construction Schedule:
 - a. Prepare detailed schedule of Contractor's operations and for all subcontractors on the project.
 - b. Monitor schedules as work progresses.
 - 1. Identify potential variances between scheduled and probable completion date.
 - 2. Recommend to Architect any adjustments in schedule to meet required completion date.
 - 3. Provide monthly summary reports of each monitoring.
 - c. Observe work to monitor compliance with schedule.
 - 1. Verify that labor and equipment are adequate to meet and maintain the schedule for the work.
 - 2. Verify that product deliveries are adequate to meet and maintain the schedule for the work.
 - 3. Report any non-compliance to Architect, with recommendations for remedy.
 - 4. Verify that adequate services are provided to comply with requirements for work and climatic conditions.
 - 5. Verify proper maintenance and operation of temporary facilities.
 - 6. Administer traffic and parking controls for construction workers. Construction traffic shall not interfere with surrounding traffic movement or the schedule of the FAMU.
 - 2. Coordination of Subcontractors:
 - a. Coordinate work of all subcontractors and relationship between them.
 - b. Establish on-site lines of authority and communication. Schedule and conduct progress meetings among Owner and Architect representatives and subcontractors.

- c. Ensure that specified cleaning is done during progress of the work and at completion of contract.

3. MEETINGS

In addition to progress meeting specified in Section 01 20 00, hold coordination meetings and preinstallation conferences with personnel and subcontractors to assure coordination of work.

4. COORDINATION OF SUBMITTALS

A. Schedule and coordinate submittals.

Administer processing of shop drawings, product data, and samples.

B. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

1. Coordinate Testing Laboratory Services:

- a. Notify laboratory of test schedule.
- b. Verify that required personnel are present.
- c. Verify that specified tests are made as scheduled.
- d. Verify compliance of the test results with specified criteria. Determine need for retesting and submit recommendations to Architect. Administer and pay for required retesting.

2. Coordinate with Sub-contractors as required:

- a. Provide temporary utilities (electric, water) required by the Subcontractors in the performance of their work.
- b. Provide designated location where the Subcontractors may place construction debris for removal by the Contractor.

C. Coordinate requests for changes to assure compatibility of space, of operating elements, and effect on work of other sections.

- 1. Recommend necessary of desirable changes to Architect.
- 2. Review subcontractor's requests for changes and substitutions. Submit recommendations to Architect.

3. Process Change Orders in accord with General Conditions and Change Order Procedures.

5. COORDINATION OF SPACE

- A. Coordinate use of Project space and sequence of installation of subcontractor work which is indicated diagrammatically on Drawings. Follow routings shown for pipes, ducts, and conduits as closely as practicable, with due allowance for available physical space; make runs parallel with lines of building. Utilize space efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- B. In finished areas, except as otherwise shown, conceal pipes, ducts, and wiring in the construction. Coordinate locations of fixtures and outlets with finish elements.

6. INTERPRETATION OF CONTRACT DOCUMENTS

- A. Consult with Architect to obtain interpretation or clarifications for any portions of the contract documents which are unclear or ambiguous. Transmit all requests for interpretation in writing.
- B. Assist in the answering of any questions which may arise.
- C. Transmit written interpretations to Sub Contractors, Suppliers and Others who's work may be affected by the clarification.
- D. Interpretations shall be based on the Architect review of the Contract Documents. In case of conflicting data, assumption shall be made that the item of greater quality, cost of quantity was bid.

7. START-UP

- A. Direct the check-out of utilities, operational systems, and equipment.
- B. Assist in initial start-up and testing.
- C. Record dates of the start of the operations of systems and equipment.

8. COORDINATION OF CONTRACT CLOSEOUT

- A. Substantial Completion:
 1. Coordinate completion and cleanup of work of separate sections in preparation for Substantial Completion.

2. When Work is ready for Substantially Complete, prepare for the Architect a list of incomplete or unsatisfactory items. See Prerequisites to Substantial Completion.
 3. Secure and transmit to Architect required Substantial Completion submittals.
- B. Final Completion:
1. When Work is ready for Final Completion:
 - a. Submit written notice to Architect that the work is ready for final inspection. See Prerequisites to Final Completion.
 - b. Secure and transmit to Architect required closeout submittals.
- C. After Owner occupancy of premises, coordinate access to site by various sections for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.
- D. Assemble and coordinate closeout submittals specified.

PART 2 - PRODUCTS:

Not used.

PART 3 - EXECUTION:

Not used.

END OF SECTION 01 04 00

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SECTION 01 06 00 - REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.1 CONTRACTOR

- A. It is the Contractor's responsibility to apply for, and obtain, the building permit prior to commencing construction.
- B. To initiate the application process, the Contractor shall submit the permit application along with two sets of construction documents (obtained from the Design Professional).
- C. A building permit will be issued after the application and associated submittals have been reviewed and approved by FAMU's Office of Environmental Health and Safety.
- D. The Contractor shall meet with the Building Code Administrator to develop a building inspection plan. The Contractor shall be responsible for scheduling all required inspections in accordance with the plan developed. Subsequent construction may not proceed until the previous phase of construction (requiring inspection) has been inspected and approved. When the Contractor believes the project is complete, the Contractor shall request that a Certificate of Completion or Certificate of Occupancy be issued.

1.2 DESIGN PROFESSIONAL

- A. The Facilities Planning and Construction Department's Design Professional, shall prepare construction documents in accordance with the requirements of the appropriate adopted codes and standards and deliver them to the Facilities Planning and Construction Department at various prescribed stages of design completion for University review. The Design Professional will also provide the Contractor with a sufficient number of construction documents as necessary to obtain the building permit.
- B. Florida A&M University will review the construction documents for code compliance at the prescribed stages of review and make comments as necessary.
- C. Facilities planning and Construction Department: During project design, the Facilities Planning and Construction Department will facilitate the design review process. This is accomplished by forwarding design documents to EH&S for review at prescribed stages of design completion and promoting the resolution of all code compliance issues raised.

END OF SECTION 01 06 00

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SECTION 01 09 00 – DEFINITIONS, STANDARDS AND REFERENCES

PART 1 - DEFINITIONS

1.1 GENERAL:

- A. Except as specifically defined otherwise, the following definitions supplement definitions of the Contract, General Conditions, Supplementary Conditions and other general contract documents, and apply generally to the work.
- B. Indicated: Shown on drawings by notes, graphics or schedules, or written into other portions of Contract Documents. Terms such as "shown", "noted", "scheduled" and "specified" have same meaning as "indicated", and are used to assist the reader in locating particular information.
- C. General: Basic Contract definitions are included in the Conditions of the Contract.
- D. “Approved”: When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Installer": Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
 - a. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.
- G. "Experienced": When used with an entity, "experienced" means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

- H. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.
- I. Directed, Requested, Reviewed, etc.: These terms imply "by the Architect/Engineer", unless otherwise indicated.
- J. "Reviewed by Architect/Engineer" in no case releases Contractor from responsibility to fulfill requirements of Contract Documents.
- K. Space available to Contractor at location of project, either exclusively or to be shared with separate contractors, for performance of the work.
- L. Furnish: Supply and deliver to project site, ready for unloading, unpacking, assembly, installation, and similar subsequent requirements.
- M. Install: Operations at project site, including unloading, unpacking, assembly, erection, placing, anchoring, applying, working dimension, finishing, curing, protecting, cleaning, and similar requirements.
- N. Provide: Furnish and install, complete and ready for intended use.
- O. Installer: Entity (firm or person) engaged to install work, by Contractor, Subcontractor or Sub subcontractor. Installers are required to be skilled in work they are engaged to install.
- P. Specification Text Format: Underscoring facilitates scan reading, no other meaning. Imperative language is directed at Contractor, unless otherwise noted.
- Q. Overlapping/Conflicting Requirements: Most stringent (generally) requirement written directly into the Contract Documents is intended and shall be enforced. Refer uncertainties to the Architect/Engineer for a decision before proceeding.
 - a. Where optional requirements are specified in parallel manner, option is intended to be Contractor's unless otherwise indicated.
- R. Minimum Requirements: Indicated requirements are for a specific minimum acceptable level of quality/quantity, as recognized in the industry. Actual work must comply (within specified tolerances), or may exceed minimums within reasonable limits. Refer uncertainties to Architect/Engineer before proceeding.
- S. Abbreviations, Plural Words: Abbreviations, where not defined in Contract Documents, shall be interpreted to mean the normal construction industry terminology, determined by recognized grammatical rules, by the Architect/Engineer. Plural words shall be interpreted as singular and singular

words shall be interpreted as plural where applicable for context of Contract Documents.

- T. Testing Laboratory: An independent entity engaged for the project to provide inspections, tests, interpretations, reports and similar services.

PART 2 - STANDARDS AND REGULATIONS

2.1 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents, unless otherwise indicated.
- C. Conflicting Requirements: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.
 - 1. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.
- D. Copies of Standards: Each entity engaged in construction on Project must be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
 - 1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source and make them available on request.
- E. Abbreviations and Acronyms for Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations as used by the construction industry.

END OF SECTION 01 09 00

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SECTION 01 20 00 - PROJECT MEETINGS

PART 1 - GENERAL:

1.1 REQUIREMENTS INCLUDED:

- A. Contractor shall attend a Pre-Construction meeting administered by the Architect/Engineer.
- B. Contractor shall schedule and administer monthly progress meetings and specially called meetings throughout progress of work.
- C. Representative of Contractors, Subcontractors and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.

1.2 PRECONSTRUCTION MEETING:

- A. Location: A site approved by owner.
- B. Attendance:
 - 1. Owner's Project Coordinator.
 - 2. Architect/Engineer and/or his professional consultants.
 - 3. Contractor's Superintendent.
 - 4. Major Subcontractors.
 - 5. Others as Appropriate.
- C. Suggested Agenda:
 - 1. Distribution and discussion of:
 - a. List of major subcontractors and suppliers.
 - b. Projected Construction Schedules.

2. Critical work sequencing.
3. Major equipment deliveries and priorities.
4. Project Coordination:
 - Designation of responsible personnel.
5. Procedures and processing of:
 - a. Field decisions.
 - b. Proposal requests.
 - c. Submittals.
 - d. Change Orders.
 - e. Applications for Payment.
6. Adequacy of distribution of Contract Documents.
7. Procedures for maintaining Record Documents.
8. Use of Premises:
 - a. Office, work and storage areas.
 - b. Owner's requirements.
9. Construction facilities, controls and construction aids.
10. Temporary Utilities.
11. Safety and first-aid procedures.
12. Security procedures.
13. Housekeeping procedures.

1.3 PROGRESS MEETINGS:

- A. Contractor shall schedule regular periodic meetings one a month (or more often if deemed appropriate by the Architect and/or Owner.) The Contractor shall be responsible for the following:
1. Prepare agenda for meetings.
 2. Distribute written agenda of each meeting four days in advance of meeting date.
 3. Make physical arrangements for meetings.
 4. Preside at meetings.
 5. Record the minutes; include significant proceedings and decisions.
 6. Reproduce and distribute copies of minutes within three days after each meeting.
 - a. To participants in the meeting.
 - b. To parties affected by decisions made at the meetings.
 - c. Furnish three copies of minutes to Architect/Engineer.
- B. Attendance:
1. Owner and Architect/Engineers and his professional consultants as needed.
 2. Subcontractors as appropriate to the agenda.
 3. Suppliers as appropriate to the agenda.
 4. Others.
- C. Suggested Agenda:
1. Review, approval of minutes of previous meetings.
 2. Review of work progress since previous meetings.
 3. Field observations, problems, conflicts.
 4. Problems which impeded Construction Schedule.

5. Review of off-site fabrication, delivery schedule.
6. Corrective measures and procedures to regain projected schedule.
7. Revisions to Construction Schedule.
8. Progress, schedule, during succeeding work period.
9. Coordination of schedules.
10. Review submittal schedules; expedite as required.
11. Maintenance of quality standards.
12. Pending changes and substitutions.
13. Review proposed changes for:
 - a. Effect on Construction Schedule and on completion date.
 - b. Effect on other contracts of the Project.
14. Review draft of payment application.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION 01 20 00

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SECTION 01 31 00 - CONSTRUCTION SCHEDULE

PART 1 - GENERAL

1.1 The Construction Schedule required under the General Conditions shall be a CPM (Critical Path Method) Schedule as described herein.

A. The CPM Schedule will consist of a time-scaled critical path graphic arrow network showing all contract activities (including shop drawings, off-site fabrication, start-up, inspections, etc.) required for completion of the Work. Work headings shall generally correspond with the headings listed in the Contractor's Schedule of Values. The schedule shall be organized by Building or major element of the Work, ie, Wastewater Treatment System, showing the planned start date, duration and completion dates for each construction activity, and the relationships between activities, for each Building or major element of the Project. The schedule shall be a complete delineation of all activities and represent a realistic approach to the Work.

B. The planning, scheduling, management, and execution of the Work is the sole responsibility of the Contractor. The Construction Schedule requirement is established to allow the Architect and Owner to review Contractor's planning, scheduling, management and execution of the work; to assist the Architect and Owner in evaluating work progress and make progress payments; and to coordinate the activities of the Owner with those of the Contractor.

1.2 INITIAL CONSTRUCTION SCHEDULE SUBMITTAL

A. The initial Construction Schedule shall be submitted for review in accordance with the General and Supplementary General Conditions. Any necessary revisions shall be incorporated into the schedule prior to acceptance by the Architect.

B. No progress payments for work performed shall be made until the Construction Schedule is submitted and accepted.

1.3 MONTHLY UPDATED CONSTRUCTION SCHEDULES

A. An Updated Construction Schedule shall be submitted each month, at the Monthly Progress Meeting, until Final Completion of the Project.

- B. The Monthly Updated Construction Schedule shall maintain, unaltered the "Original" Construction Schedule, except that any Change Orders adjusting the Contract Time shall be appropriately incorporated into the "Original" Construction Schedule. The Monthly Updated Construction Schedule shall differentiate the "Original" Construction Schedule from the Monthly Progress Schedule.
- C. The Monthly Progress Schedules shall differentiate between "planned" and "actual" activities and shall be updated to include:
 - 1. Actual completion dates for activities completed during the report period, and actual start dates for activities commenced during the report period.
 - 2. Estimated start dates for activities scheduled to commence during the following report period.
 - 3. Any required additional workforce or extended workdays or workweeks required to maintain or accelerate durations of any activities required to maintain the Construction Schedule.
 - 3. Changes in the duration of any activity and minor logic changes.
 - 4. Added activities not already included in the currently accepted Construction Schedule.
 - 5. Major changes in scope, incorporation of Change Orders, and other identifiable changes.

1.4 TIME EXTENSIONS

- A. Change order requests that include proposed extensions to the overall contract duration shall be substantiated by graphical and report-based illustrations of the effect of the change upon the project's Critical Path.
- B. Claims for weather-based delays shall include substantiation of the actual and "normal" weather for the period and location in question, along with documentation that links those period(s) with actual adverse impact *on* Critical Path activities in the schedule.

1.5 DISTRIBUTION

- A. Distribute copies of the Initial and Monthly Updated Construction Schedules to:
 - 1. Architect

2. Job Site
 3. Subcontractors
 4. Other concerned parties
- B. Instruct recipients to report promptly to the Contractor, in writing, any problems anticipated by the projections shown in the schedules.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION 01 31 00

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SECTION 01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
1. Preliminary Construction Schedule.
 2. Contractor's Construction Schedule.
 3. Submittals Schedule.
 4. Daily construction reports. (If required)
 5. Material location reports.
 6. Field condition reports.
 7. Special reports.
 8. Construction photographs.

1.2 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
1. Critical activities are activities on the critical path. They must start and finish on the planned early start and finish times.
 2. Predecessor activity is an activity that must be completed before a given activity can be started.
- B. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.
- C. Critical Path: The longest continuous chain of activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- D. Event: The starting or ending point of an activity.
- E. Float: The measure of leeway in starting and completing an activity.

1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the following activity.
 3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.
- F. Fagnet: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.
- G. Major Area: A story of construction, a separate building, or a similar significant construction element.
- H. Milestone: A key or critical point in time for reference or measurement.
- I. Network Diagram: A graphic diagram of a network schedule, showing activities and activity relationships.

1.3 SUBMITTALS

- A. Qualification Data: For firms and persons specified in "Quality Assurance" Article and in-house scheduling personnel 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.
- B. Submittals Schedule: Submit one copy of schedule. Arrange the following information in a tabular format:
1. Scheduled date for first submittal.
 2. Specification Section number and title.
 3. Submittal category (action or informational).
 4. Name of subcontractor.
 5. Description of the Work covered.
 6. Scheduled date for Architect's final release or approval.
- C. Contractor's Construction Schedule: Submit one printed copies of initial schedule, large enough to show entire schedule for entire construction period.
- D. Construction Photographs: Submit prints of each photographic view with construction manager's monthly report.
- E. Daily Construction Reports: Submit one copy at Progress Meeting intervals.
- F. Material Location Reports: Submit one copy at Progress Meeting intervals.
- G. Special Reports: Submit one copy at time of unusual event. (If Applicable)

- H. All submitted information shall be available to Owner and Architect in .pdf format, if requested.

1.4 QUALITY ASSURANCE

- A. Scheduling Consultant Qualifications: An experienced specialist in CPM scheduling and reporting.

1.5 COORDINATION

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
- B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from parties involved.
 - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Procedures: Comply with procedures contained in AGC's "Construction Planning & Scheduling."
- B. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Substantial Completion.
 - 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- C. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:
 - 1. Activity Duration: Define activities so no activity is longer than **20** days, unless specifically allowed by Architect.
 - 2. Procurement Activities: Include procurement process activities for long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.

3. Submittal Review Time: Include review and resubmittal times indicated in Division 1 Section "Submittals" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
 4. Startup and Testing Time: Include not less than three days for startup and testing.
 5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
- D. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
1. Phasing: Arrange list of activities on schedule by phase.
 2. Work under More Than One Contract: Include a separate activity for each contract.
 3. Products Ordered in Advance: Include a separate activity for each product. Include delivery date. Delivery dates indicated stipulate the earliest possible delivery date.
 4. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Coordination with existing construction.
 - b. Limitations of continued occupancies.
 - c. Uninterruptible services.
 - d. Partial occupancy before Substantial Completion.
 - e. Use of premises restrictions.
 - f. Provisions for future construction.
 - g. Seasonal variations.
 - h. Environmental control.
 5. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
 - a. Subcontract awards.
 - b. Submittals.
 - c. Purchases.
 - d. Mockups.
 - e. Fabrication.
 - f. Sample testing.
 - g. Deliveries.
 - h. Installation.
 - i. Tests and inspections.
 - j. Adjusting.
 - k. Curing.
 - l. Startup and placement into final use and operation.
 6. Area Separations: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:

- a. Structural completion.
 - b. Permanent space enclosure.
 - c. Completion of mechanical installation.
 - d. Completion of electrical installation.
 - e. Substantial Completion.
- E. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, interim milestones indicated below, Substantial Completion, and Final Completion.
- F. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragments to demonstrate the effect of the proposed change on the overall project schedule.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

- A. General: Prepare network diagrams using AON (activity-on-node) format.
- B. Preliminary Network Diagram: Submit diagram within 7 days of date established for the Notice to Proceed. Outline significant construction activities for the first 60 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.
- C. CPM Schedule: Prepare Contractor's Construction Schedule using a CPM network analysis diagram.
- 1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than 14 days after date established for the Notice to Proceed.
 - 2. Conduct educational workshops to train and inform key Project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM schedule information.
 - 3. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
 - 4. Use "one workday" as the unit of time.
- D. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the preliminary network diagram, prepare a skeleton network to identify probable critical paths.
- 1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
 - a. Preparation and processing of submittals.
 - b. Purchase of materials.

- c. Delivery.
 - d. Fabrication.
 - e. Installation.
- 2. Processing: Process data to produce output data or a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
- 3. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
 - a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.
- E. Initial Issue of Schedule: Prepare initial network diagram from a list of straight "early start-total float" sort. Identify critical activities. Prepare tabulated reports showing the following:
 - 1. Contractor or subcontractor and the Work or activity.
 - 2. Description of activity.
 - 3. Principal events of activity.
 - 4. Immediate preceding and succeeding activities.
 - 5. Early and late start dates.
 - 6. Early and late finish dates.
 - 7. Activity duration in workdays.
 - 8. Total float or slack time.
- F. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
 - 1. Identification of activities that have changed.
 - 2. Changes in early and late start dates.
 - 3. Changes in early and late finish dates.
 - 4. Changes in activity durations in workdays.
 - 5. Changes in the critical path.
 - 6. Changes in total float or slack time.
 - 7. Changes in the Contract Time.

2.3 REPORTS (If Required by Owner)

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
 - 1. List of subcontractors at Project site.
 - 2. List of separate contractors at Project site.
 - 3. Approximate count of personnel at Project site.
 - 4. High and low temperatures and general weather conditions.
 - 5. Accidents.

6. Meetings and significant decisions.
 7. Unusual events (refer to special reports).
 8. Stoppages, delays, shortages, and losses.
 9. Meter readings and similar recordings.
 10. Emergency procedures.
 11. Orders and requests of authorities having jurisdiction.
 12. Change Orders received and implemented.
 13. Construction Change Directives received.
 14. Services connected and disconnected.
 15. Equipment or system tests and startups.
 16. Partial Completions and occupancies.
 17. Substantial Completions authorized.
- B. Material Location Reports: At monthly intervals, prepare a comprehensive list of materials delivered to and store at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.
- C. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare a detailed report. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Contractor's Construction Schedule Updating: At monthly Progress Meeting intervals, update schedule to reflect actual construction progress and activities. Issue schedule two days before each regularly scheduled progress meeting.
1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 3. As the Work progresses, indicate Actual Completion percentage for each activity.
- B. Distribution: Distribute copies of approved schedule to Architect Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
1. Post copies in Project meeting rooms and temporary field offices.

2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

3.2 CONSTRUCTION PHOTOGRAPHS

- A. Photos shall be digital clear units.
- B. Date Stamp: Unless otherwise indicated, date and time stamp each photograph as it is being taken so stamp is integral to photograph.
- C. Periodic Construction Photographs: Take as required color photographs monthly, coinciding with cutoff date associated with each Application for Payment. Photographer shall select vantage points to best show status of construction and progress since last photographs were taken.

END OF SECTION 01 32 00

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SECTION 01 34 00 - SUBMITTALS

PART 1 – GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Submit Shop Drawings, Product Data and Samples required by Contract Documents.
- B. Submittals may include, but are not limited to the following:
 - 1. All items listed in each section of specifications.
 - 2. Submittals required to be submitted to Owner when submitted to Architect/Engineer

1.2 RELATED REQUIREMENTS:

- A. Definitions and Additional Responsibilities of Parties: General Conditions of the Contract.
- B. Designate in the Construction Schedule, Application for Payments, or in a separate coordinated schedule, the dates for submission of Shop Drawings, Product Data and Samples.
- C. Contractual Conditions
- D. Note requirements for mechanical and electrical submittals in Division 15 and 16 specifications.
- E. As required by Florida Statute 553.842 and Florida Administrative Code 9B-72, provide the information and approval numbers on the building components listed on the Florida Product Approval Specification Sheet (form is attached at the end of this section) if they will be utilized on this construction project. Statewide approved products are listed online at www.floridabuilding.org.

1.3 SHOP DRAWINGS

- A. Drawings shall be presented in a clear and thorough manner.
- B. Details shall be identified by reference to sheet and detail, schedule or room numbers shown on Contract Drawings.

- C. Shall be original drawings, prepared by Contractor, Subcontractor, Supplier or Distributor, which illustrate some portion of the work, showing fabrication, layout, setting or erection details. Duplication of contract Documents for any submittal shall not be acceptable.
 - 1. Prepared by a qualified detailer.
 - 2. Identify details by reference to sheet and detail numbers shown on Contract Drawings.
- D. Shop Drawing transmittal letter shall be submitted separate for each required section as provided at the end of this section. Submittal shall note any and all deviations from Contract Documents.

1.4 PRODUCT DATA:

- A. Preparation
 - 1. Clearly mark each copy to identify pertinent products or models.
 - 2. Show performance characteristics and capacities.
 - 3. Show dimensions and clearances required.
 - 4. Show wiring or piping diagrams and controls.
 - 5. Note deviations from Contract Documents.
- B. Manufacturer's standard schematic drawings and diagrams:
 - 1. Modify drawings and diagrams to delete information which is not applicable to the work.
 - 2. Supplement standard information to provide information specifically applicable to the work.
 - 3. Note deviations from Contract Documents.

1.5 SAMPLES:

- A. Office samples shall be of sufficient size and quantity to clearly illustrate materials, equipment or workmanship, and to establish standards by which completed work is to be judged.
 - 1. Functional characteristics of the product, with integrally related parts and attachment devices.
 - 2. Full range of color, texture and pattern.
 - 3. After review, samples shall be used for comparison in construction of project.
 - 4. Note deviations from Contract Documents.
- B. Field samples and mock-ups.
 - 1. Erect at project site at location acceptable to Architect/Engineer.
 - 2. Construct each sample or mock-up complete, including work of all trades required in finished work.
 - 3. Note deviations from Contract Documents.

1.6 CONTRACTOR RESPONSIBILITIES:

- A. Review Shop Drawings, Product Data and Samples prior to submission.
- B. Check and stamp submittal with his approval.
- C. Determine and verify:
 - 1. Field measurements.
 - 2. Field construction criteria.
 - 3. Catalog numbers and similar data.
 - 4. Conformance with specifications.
 - 5. Note deviations from Contract Documents.
- D. Coordinate each submittal with requirements of the work and of the Contract Documents.
- E. Notify the Architect/Engineer in writing, at time of submission, of his review and approval of submittal and of any deviations in the submittals from requirements of the Contract Documents.
 - 1. Contractor's responsibility for deviations in submittals from requirements of Contract Documents is not relieved by Architects/Engineers review of submittals, unless specific deviations are called to the attention of the Architect/Engineer in writing and the Architect/Engineer gives written acceptance of specific deviations.
 - 2. Contractor's responsibility for errors and omissions in submittals is not relieved by Architect's/Engineer's review of submittals.
- F. Begin no fabrication or work which requires submittals until return of submittals with Architect/Engineer review.
- G. Submittals not reviewed and approved by the Construction Manager will be rejected.

1.7 ELECTRONIC COPIES OF FILES

- A. The General Contractor or Construction Manager can purchase from the architect a single electronic CADD file copy of the construction documents. The cost to the contractor is \$1,500.00.
- B. All request for CADD files will be fulfilled by the General Contractor. No request will be made to the Architect.
- C. If the General contractor chooses not to purchase the entire set of files from the Architect, no CADD files will be released to any Sub-Contractor or Supplier.
- D. Any purchased drawings or documents may be subject to change without notice. Responsibility for the accuracy of current conditions and/or digital transfers is solely that of the user. These conditions of use shall be supplied to all users of this data. The signed &

sealed documents take precedence over magnetic or electronically stored medium. JRA Architects, Inc. or its Consultants makes no warranties, express or implied, concerning the accuracy of the information contained in any documents transmitted or reviewed by computer or other electronic means.

1.8 SUBMISSION REQUIREMENTS

- A. Within 21 days of Notice-to-Proceed, furnish a Schedule of Submittals, coordinated with the Construction Schedule, listing all submittals to be made with the following information provided:
 - 1. Identification of Product, Item or Trade.
 - 2. Specification Section reference.
 - 3. Date scheduled to be submitted.
 - 4. Priority of importance of submittal.

- B. Make submittals promptly in accordance with accepted schedule, and in such sequence as to cause no delay in the work or in the work of any other Contractor. Use transmittal format included herein.

- C. Number of submittals required:
 - 1. Shop Drawings: Submit five (5) blue-line prints of shop Drawing, four blue-line will be returned to the Contractor.
 - 2. Product Data: Submit four (4) copies of Product data of which three (3) shall be returned to the Contractor.
 - 3. Samples: Submit the number stated in each specification section. Provide five (5) samples if not indicated, of which two (2) shall be returned to Contractor.
 - 4. In-lieu of hard copies required above, the contractor may use an outline based construction management program by which electronic submittals may be submitted to and approved by the Architect or Engineer.

- D. Submittals shall contain:
 - 1. The date of submission and the dates of any previous submissions.
 - 2. The project title and number.
 - 3. Contract identification.
 - 4. The names of Contractor, Supplier and Manufacturer.
 - 5. Identification of the product, with the specification section number.
 - 6. Field dimensions, clearly identified as such.
 - 7. Relation to adjacent or critical features of the work or materials.
 - 8. Identification of revisions on resubmittals.
 - 9. Applicable Standards (such as ASTM or Federal Specification numbers).
 - 10. An 8 inch x 3 inch blank space for contractor and Architect/Engineer or provide review status cover page.
 - 11. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of products, field measurements and field construction criteria, and coordination of

the information within the submittal with requirements of the work and of Contract Documents.

- E. Submittal requirements for Engineering Seal must be prepared by a Florida Registered Professional Engineer

1.9 RE-SUBMISSION REQUIREMENTS

- A. Make any corrections or changes in the submittals required by the Architect/Engineer and resubmit until accepted.
- B. Shop drawings and product data:
 - 1. Revise initial drawings of data, and resubmit as specified for the initial submittal.
 - 2. Cloud any change which has been made other than those required by the Architect/Engineer.
 - 3. Indicate shop drawing is being resubmitted, use Architect's/Engineer's shop drawing identification number if provided.
- C. Samples: Submit new samples if requested by Architect.

1.10 DISTRIBUTION

- A. Distribute reproductions of Shop Drawings and copies of Product Data which carry the Architect/Engineer stamp of acceptance to:
 - 1. Job site file.
 - 2. Subcontractors.
 - 3. Supplier or Fabricator.
 - 4. Project close-out documents.

1.11 ARCHITECT/ENGINEER DUTIES

- A. Review submittals; allow Architect/Engineer a period of 21 calendar days for review and return of Shop drawings.
- B. Affix stamp and initials or signature and indicate requirements for resubmittal or approval of submittal.
- C. Return submittals to Contractor for distribution or for re-submission.

1.12 COLOR SUBMITTALS

- A. All Submittals which require Architects approval of color shall be submitted within 60 days of notice to proceed.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION

3.1 Shop Drawing Submittals shall be reviewed in accord with the following:

- A. Review by Architect/Engineer of Record of submittals is for general conformance with the design concept as presented by the Contract Documents. No detailed check of quantities or dimensions will be made.
- B. The General Contractor is responsible for assuring that all submittals comply with the latest project plans, specifications, governing codes and regulations and is solely responsible for confirming all quantities, dimensions, fabrication techniques and coordinating work with all trades.
- C. Shop drawings are to be submitted in a timely manner allowing adequate time for processing.
- D. Submit shop drawings for specific components, such as columns, footings, etc., in their entirety. Shop drawings for similar floors shall be submitted in the same package.
- E. All submittals are to be accompanied by a letter of transmittal. Do not combine different submittals on the same transmittal.
- F. All shop drawings must bear evidence of the Contractor's approval prior to submitting to the Architect/Engineer of Record.
- G. Submit quantities per Part 1: 8.C unless otherwise requested.
- H. All changes and additions made on re-submittals must be clearly flagged and noted. The purpose of the re-submittals must be clearly noted on the letter of transmittal. Architect/Engineer of Record review is limited to those items causing the resubmission.
- I. For criteria applicable to shop drawings requiring engineering input by a specialty engineer, see below.
- J. Shop drawings not meeting the above criteria or submitted after fabrication will not be reviewed.
- K. The Contract Documents are not to be reproduced for use as shop drawings.

3.2 Shop Drawings requiring input by Specialty Engineer shall be reviewed in accord with the following:

- A. Specialty Engineer:

1. Definition - A Florida registered professional engineer, not the structural engineer of record, who specializes in and who undertakes the design of structural components or structural systems included in a specific submittal prepared for this project.
 2. Shall be:
 - a. An employee or officer of a fabricator.
 - b. An employee or officer of an entity supplying components to a fabricator.
 - c. An independent consultant retained by the fabricator of his supplier
- B. Shop Drawings requiring a specialty engineer are fabrication and erection drawings prepared for, but not limited to the following items:
1. Precast concrete components, formwork and falsework shoring and reshoring.
- C. Submittals shall clearly identify the specific project, applicable codes, list the design criteria, and shall show all details and plans necessary for proper fabrication and installation. Calculations and shop drawings shall identify specific product utilized. Generic products will not be accepted.
- D. Shop drawings and calculations must be prepared under the direct supervision and control of the specialty engineer.
- E. Shop drawings and calculations require the impressed seal, date and signature of the specialty engineer. Computer printouts are an acceptable substitute for manual computations provided they are accompanied by sufficient descriptive information to permit their proper evaluation. Such descriptive information shall bear the impressed seal and signature of the specialty engineer as an indication that he has accepted responsibility for the results. Sepias do not require signature and seal. Architect/Engineer of Record will retain one signed and sealed blue-line print for record.
- F. Drawings prepared solely to serve as a guide for fabrication and installation (such as reinforcing steel shop drawings or structural steel erection drawings) and requiring no engineering input do not require the seal of a specialty engineer.
- G. Catalog information on standard products does not required the seal of a specialty engineer.
- H. Review by the Architect and Structural Engineer of record of submittals is limited to verifying the following:
1. That the specified structural submittals have been furnished.
 2. That the structural submittals have been signed and sealed by the specialty engineer.
 3. That the specialty engineer has understood the design intent and has used the specified structural criteria. (No detailed check of calculations will be made.)
 4. That the configuration set forth in the structural submittals is consistent with the contract documents. (No detailed check of dimensions or quantities will be made.)
- I. List of drawings shall be prepared and maintained for all shop drawings requiring participation of a specialty engineer. The list shall contain project name, name of General Contractor, name of subcontractor, name of specialty engineer, drawings number, drawing

title and latest revision number and date. For partial submittals, the list shall contain all anticipated drawing numbers and titles required to complete the contract. The General Contractor is responsible for submitting the latest updated list of drawings with each submittal.

- J. Upon the completion of the submittal process for the project, the General Contractor shall submit to the Architect/Engineer of record a notarized affidavit stating the following:
 - 1. "This is to certify that the undersigned as General Contractor for the referenced project has furnished to and has received acceptance from the Architect/Engineer of Record for all structural submittals requiring participation of a specialty engineer. These submittals were prepared for work performed by the following subcontractors: (name of subcontractors)..." The final lists of shop drawings shall be attached to the affidavit.
- K. Submittals not meeting the above criteria will not be reviewed.
- L. Submit quantities per Part 1: 8.C, unless otherwise requested.
- M. Partial submittals will be returned to contractor and will not be reviewed.

END OF SECTION 01 34 00

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SECTION 01 51 00 - TEMPORARY & PERMANENT UTILITY CONNECTIONS

PART 1 - GENERAL

1.1 REQUIREMENTS: Furnish, install and maintain temporary utilities required for construction, remove on completion of work. These may include, but are not limited to, the following:

- A. Temporary lighting and power for all construction activities, including extension of temporary electrical service into building.
- B. Temporary heat and ventilation.
- C. Temporary water for construction, including all distribution systems.
- D. Temporary sanitary facilities for construction personnel.
- E. Temporary fire protection system as required by local authorities.
- F. Provide and make available for use by Subcontractors temporary light, power and water required in the performance of their Work as part of the Work of this Section.

1.2 REQUIREMENTS OF REGULATORY AGENCIES:

- A. Comply with National Electric Code.
- B. Comply with Federal, State and local codes and regulations and with utility company requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. May be new or used, but must be adequate in capacity for the required usage, must not create unsafe conditions and must not violate requirements of applicable codes and standards.

2.2 TEMPORARY ELECTRICITY AND LIGHTING

- A. Arrange with utility company, provide service required for power and lighting, and pay all costs for service and for power used.
 - 1. Provide required disconnects, grounding, and all other devices and appurtenances required by all applicable agencies and codes, and remove same upon completion of work.
 - 2. Provide generator, if required, to obtain power required which is greater than temporary services furnished.
 - 3. Provide all required transformers, fused main switches, distribution boards, panels, but-outs, wiring and grounding, sockets, lamps, fuses and motor connections to suit all load and safety requirements.
- B. Install circuit and branch wiring, with are distribution boxes located so that power and lighting is available throughout the construction by the use of construction type power cords.
- C. Provide adequate artificial lighting for all areas of work when natural light is not adequate for Work and for areas accessible to the public.
- D. Provide and maintain temporary feeders to permanent mechanical equipment requiring service, including ventilation, until permanent feeds are connected and energized.
- E. After permanent power has been switched over, remove those portions of temporary light and power installation which are the responsibility of the Contractor.
- F. Provide temporary site security lighting to maintain 3 fc measured minimum light level.

2.3 TEMPORARY WATER:

- A. The Contractor shall provide water tap for construction purposes and pay all costs for installation, maintenance and removal. The Contractor shall provide a meter.
- B. Install branch piping with taps located so that water is available throughout the construction. Protect piping and fittings against freezing.

2.4 TEMPORARY SANITARY FACILITIES:

- A. Provide sanitary facilities in compliance with laws and regulations.

1. Since no services will be available for temporary toilets, provide, maintain and remove when directed, portable chemical toilets for construction personnel.
 2. Provide quantity and location of temporary toilets as required by authorities having jurisdiction, including, but not limited to OSHA, and subject to further directions by the Engineer. Temporary toilets shall be located as accepted by the Owner and Architect/Engineer.
- B. Service, clean and maintain facilities and enclosures.
- C. Field office trailer toilet may be provided with holding tank to be maintained and serviced by the Contractor.

2.5 TEMPORARY FIRE PROTECTION SYSTEM

- A. Provide temporary fire protection systems for the project in accord with NFPA Standard #241.

PART 3 - EXECUTION

3.1 GENERAL:

- A. Comply with applicable requirements specified within other divisions of the specifications.
- B. Maintain and operate systems to assure continuous service.
- C. Modify and extend systems as work progress requires.

3.2 REMOVAL

- A. Completely remove temporary materials and equipment when their use is no longer required.
- B. Clean and repair damage caused by temporary installations or use of temporary facilities.
- C. Restore existing facilities used for temporary services to specified, or to original condition.
- D. Restore permanent facilities used for temporary services to specified condition. Prior to Final Inspection, remove temporary lamps and install new lamps.

END OF SECTION 01 51 00

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SECTION 01 60 00 - MATERIAL AND EQUIPMENT

PART 1 - GENERAL

1.1 REQUIREMENTS

- A. Material and Equipment Incorporated into the Work:
1. Conform to the applicable specifications and standards.
 2. Comply with size, make, type and quality specified, or as specifically accepted in writing by the Architect.
 3. Manufactured and Fabricated Products:
 - a. Design, fabricate and assemble in accord with the best engineering and shop practices.
 - b. Manufacturer like parts of duplicate units to standard sizes and gauges, to be interchangeable.
 - c. Two or more items of the same kind shall be identical, by the same manufacturer.
 - d. Products shall be suitable for service conditions.
 - e. Equipment capacities, sizes and dimensions shown or specified shall be adhered to unless variations are specifically accepted in writing.
 4. Do not use material or equipment for any purpose other than that for which it is designed or is specified.

1.2 MANUFACTURER'S INSTRUCTIONS:

- A. When Contract Documents require that installation of Work shall comply with manufacturer's printed instructions, obtain and distribute copies of such instructions to parties involved in the installation, including an electronic copy to the Architect.
1. Maintain one set of complete instructions at the job site during installation and until complete.
- B. Handle, install, connect, clean, condition and adjust products in strict accord with such instructions and in conformity with specified requirements.
1. Should job conditions or specified requirements conflict with manufacturer's instructions, consult with Architect/Engineer for further instructions.
 2. Do not proceed with work without clear instructions.
- C. Perform Work in accord with manufacturer's instructions, unless otherwise specified. Do not omit any preparatory step or installation procedure unless specifically modified or exempted by Contract Documents.

1.3 TRANSPORTATION AND HANDLING:

- A. Arrange deliveries of Products in accord with construction schedules, coordinate to avoid conflict with Work and conditions at the site.
 - 1. Deliver Products in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.
 - 2. Immediately on delivery, inspect shipments to assure compliance with requirements of Contract Documents and submittals, and that Products are properly protected and undamaged.
- B. Provide equipment and personnel to handle Products by methods to prevent soiling or damage to Products or packaging.

1.4 STORAGE AND PROTECTION:

- A. Store products in accord with manufacturer's instructions, with seals and labels intact and legible.
 - 1. Store products subject to damage by the elements in weathertight enclosures.
 - 2. Maintain temperature and humidity within the ranges required by manufacturer's instructions.
- B. Exterior Storage.
 - 1. Store fabricated products above the ground, on blocking or skids, prevent soiling or staining. Cover products which are subject to deterioration with impervious sheet coverings, provide adequate ventilation to avoid condensation.
 - 2. Store loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter.
- C. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored Products to assure that Products are maintained free from damage or deterioration.
- D. Remove and replace materials which are damaged or deteriorated from the site.
- E. Protection After Installation:
 - 1. Provide substantial coverings as necessary, to protect installed products from damage from traffic, water and subsequent construction operations. Remove when no longer needed.
 - 2. Remove and replace installed products which are subsequently damaged or deteriorated from the Project.

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 NOT USED

END OF SECTION 01 60 00

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SECTION 01 70 00 – CONTRACT CLOSEOUT

PART 1 - GENERAL

1.1 PREREQUISITES TO SUBSTANTIAL COMPLETION

- A. Prior to requesting Architect's/Engineer's inspection for substantial completion of either entire Work or portions thereof, complete the following and list all known exceptions in request:
1. Submit to Architect a complete, comprehensive list of every incomplete and unsatisfactory item in the Work. The list shall differentiate between incomplete and unsatisfactory items.
 2. For all incomplete and unsatisfactory items, list the reasons for being incomplete or unsatisfactory, the date the item will be completed and the estimated cost to complete the item.
 3. Submit all items required in individual Specifications Sections.
 4. Submit specific warranties, workmanship/maintenance bonds, maintenance agreements, final certifications and similar documents.
 5. Deliver keys, tools, spare parts, extra stocks of materials and similar physical items to Owner.
 6. Complete start-up testing of systems and instructions of Owner's operating/maintenance personnel. Discontinue (or change over) and remove from project site temporary facilities and services, along with construction tools and facilities, mock-ups and similar elements.
 7. Obtain and submit releases enabling Owner's full and unrestricted use of the Work and access to services and utilities, including (where required) occupancy permits, operating certificates and similar releases.
 8. Advise Owner of pending insurance change-over requirements.
- B. Substantial Completion Inspection
1. Upon receipt of Contractor's request, Architect/Engineer will either proceed with observations or advise contractor of prerequisites not fulfilled. Following initial observations, Architect/Engineer will either prepare a Certificate of Substantial Completion or advise Contractor of work which must be performed prior to issuance of Substantial Completion Certificate. If another observation is required, the Contractor shall submit with his request for another observation, a list of previously incomplete or unsatisfactory work and shall certify that all items prerequisite to Substantial Completion are complete. The Architect will only perform observations upon receipt of this request. Unsatisfactory items remaining

at the completion of the Substantial Completion Inspection will form the "Punch-List" for completion prior to Final Acceptance.

2. If the Architect has to make more than one observation trip due to Contractor failure to Substantially Complete the Work, the Owner shall deduct the Architect's expenses for subsequent Inspection Trips from the Contract Amount.

1.2 PREREQUISITES TO FINAL ACCEPTANCE

- A. Prior to requesting Architect's and FAMU's observation for final acceptance, complete the following and list known exceptions (if any) in request:

1. Submit a copy of the Substantial Completion "Punch List" certifying that each item has been completed or otherwise resolved or accepted. For any item remaining incomplete due to circumstances accepted by the Architect, indicate the date item will be completed and the cost of completion.
2. Submit record drawings, maintenance manuals, final project photographs, damage or settlement survey, property survey and similar final record information.
3. Complete final cleaning up requirements, including touch-up of marred surfaces.
4. Submit final meter readings for utilities, measured record of stored fuel and similar data as of time of substantial completion or when Owner took possession of and responsibility for corresponding elements of the work.
5. Revise and submit evidence of final, continuing insurance coverage complying with insurance requirements.
6. Submit final liquidated damages settlement statement, acceptable to Owner.
7. Submit updated final statement accounting for additional (final) changes to Contract Sum.
8. Submit original Consent of Surety.
Submit final payment request with final releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.

- B. Final Inspection:

1. Upon receipt of Contractor's certification that work has been completed and requesting Final Observation, the Architect and FAMU will reinspect work. Upon completion of reinspection, Architect will either prepare certificate of final acceptance of occupancy or advise Contractor of work not completed or obligations not fulfilled as required for final acceptance. If necessary, procedure will be repeated.
2. If the Architect has to make more than one Final Observation trip due to Contractor failure to Finally Complete the Work, the Owner shall deduct the Architect's expenses for subsequent Observation Trips from the Contract Amount.

1.3 RECORD DOCUMENT SUBMITTAL

- A. Provide Record Documents as outlined in Project Record Document Section.
- B. Record Drawings.

- C. Record Specifications:
 - 1. Maintain one copy of specifications including addenda, change orders and similar modifications issued in printed form during construction and mark-up variations (of substance) in actual Work in comparison with text of specifications and modifications as issued. Give particular attention to substitutions, selection of options and similar information on work where it is concealed or cannot otherwise be readily discerned at a later date by direct observation. Note related record drawing information and product data where applicable.

- D. Record Shop Drawings and Product Data:
 - 1. Maintain one copy of each reviewed product data submittal and mark-up significant variations in actual work in comparison with submitted information. Include both variations from manufacturer's instructions and recommendations for installation. Give particular attention to concealed products and portions of the Work which cannot otherwise be readily discerned at a later date by direct observation. Note related change orders and mark-up or record drawings and specifications.

- E. Record Sample Submittal:
 - 1. Immediately prior to date(s) of substantial completion, Architect will meet with Contractor at site and will determine which (if any) of submitted samples maintained by Contractor during progress of the work are to be transmitted to Owner for record purposes. Comply with Architect's instructions for packaging, identification marking and delivery to owner's sample storage space.

- F. Miscellaneous Record Submittals:
 - 1. Refer to other sections of these specifications for requirements of miscellaneous record-keeping and submittals in connection with actual performance of the Work. Immediately prior to date(s) of substantial completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference.

- G. Operation and Maintenance Data:
 - 1. See Individual Sections

- H. Warranties and Bonds:
 - 1. See Individual Sections

- I. Spare Parts and Maintenance Materials:
 - 1. See Individual Sections

1.4 FINAL CLEANING

- A. Special cleaning for specific units of work is specified in sections of Divisions 2 through 16. General cleaning during progress or work is specified in General Conditions and as temporary service in "Temporary Facilities" section of this Division and in section 01 70 00-Final Cleaning. Provide final cleaning of the work at time indicated, consisting of cleaning each surface or unit of Work to normal "clean" condition expected for a first-

class building cleaning and maintenance program. Comply with manufacturer's instructions for cleaning operations. The following are examples of cleaning levels required:

1. Clean project site (yard and grounds) of litter and foreign substances. Sweep paved areas to a broom-clean condition; remove stains, petro-chemical spills and other foreign deposits. Rake grounds which are neither planted nor paved, to a smooth, even-textured surface.
2. See Section other sections in the specifications.

B. Removal of Protection:

1. Remove temporary protection devices and facilities which were installed during course of the Work to protect previously completed Work during remainder of construction period.

C. Compliances:

1. Comply with safety standards and governing regulations for cleaning operations. Do not burn waste materials at site or bury debris or excess materials on Owner's property or discharge volatile or other harmful or dangerous materials into drainage systems; remove waste materials from site and dispose of in a lawful manner.
2. Where extra materials of value remaining after completion of associated Work have become Owner's property, which are not accepted by the Owner shall be disposed of to Owner's best advantage as directed.

1.5 CLOSEOUT DOCUMENT CHECKLIST

A. All items listed below shall be bound in individual heavy duty 3-ring vinyl covered binders. Mark appropriate identification on front and spine of each binder.

1. List of contractors and every subcontractor and material supplier performing work on the Project including:
 - a. work or trade performed, or material supplied
 - b. name of contact person
 - c. Firm name, address, phone and fax number
2. Contractor's Guarantee and Warranties as specified under Division 01 74 00.
3. Fully executed Roof Warranty in the name of the Owner.
4. Special warranties as required by the specifications, in the name of the Owner.
5. Provide a list summarizing the various guarantees and warranties and stating the following with respect to each:
 - a. Character of work affected.
 - b. Name, address and telephone number of each Subcontractor.
 - c. Name, address and telephone number of each local firm designated to provide warranty service for an out-of-town firm. Copy of agreement between the firms.
 - d. Period of guarantee and effective date.
6. Verification that the Owner's personnel has been trained in the use of all equipment and systems. Submit attendance lists of all training sessions.
7. Operation and Maintenance Manuals.

8. Equipment Inventory List - A list of the equipment furnished for the project, to include drawings code designation, location, description, manufacturer, full model number, serial number, warranty period and warranty expiration date.
9. As-built drawings. Provide in accordance with other specification sections.
10. Energy management system programming, operation, maintenance, and parts service manuals.

END OF SECTION 01 70 00

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SECTION 01 71 00 - FINAL CLEANING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for final cleaning at Substantial Completion.
- B. Environmental Requirements: Conduct cleaning and waste-disposal operations in compliance with local laws and ordinances. Comply fully with federal and local environmental and antipollution regulations.
 - 1. Do not dispose of volatile wastes, such as mineral spirits, oil, or paint thinner, in storm or sanitary drains.
 - 2. Burning or burying of debris, rubbish, or other waste material on the premises is not permitted.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by the manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Provide final-cleaning operations when indicated. Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit of Work to the condition expected from a commercial building cleaning and maintenance program. Comply with manufacturer's instructions.
- B. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for the entire Project or a portion of the Project.
 - 1. Clean the Project Site, yard and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and foreign substances.
 - 2. Sweep paved areas broom clean. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - 3. Remove petrochemical spills, stains, and other foreign deposits.
 - 4. Remove tools, construction equipment, machinery, and surplus material from the site.
 - 5. Leave the Project clean and ready for the Owners usage.
- C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid the Project of rodents, insects, and other pests. Comply with regulations of local authorities.
- D. Removal of Protection: Remove temporary protection and facilities installed during construction to protect previously completed installations during the remainder of the construction period.
- E. Compliances: Comply with governing regulations and safety standards for cleaning operations. Remove waste materials from the site and dispose of lawfully.
 - 1. Where extra materials of value remain after completion of associated Work, they become the Owner's property. Dispose of these materials as directed by the Owner.

END OF SECTION 01 71 00

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SECTION 01 72 00 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for Project Record Documents.
- B. Project Record Documents required include the following:
 - 1. Marked-up copies of Contract Drawings.
 - 2. Marked-up copies of Shop Drawings.
 - 3. Newly prepared drawings.
 - 4. Marked-up copies of Specifications, addenda, and Change Orders.
 - 5. Marked-up Product Data submittals.
 - 6. Record Samples.
 - 7. Field records for variable and concealed conditions.
 - 8. Record information on Work that is recorded only schematically.
- C. Multiple Prime Contracts: Each prime contractor is responsible for obtaining, maintaining, and recording Project Record Document information for its own Work. The Construction Manager is responsible for coordinating information, where information from more than one prime contractor is to be integrated with information from other prime contractors to form one combined record.
- D. Maintenance of Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition. Make documents and Samples available at all times for the Architect's inspections.

1.2 RECORD DRAWINGS

- A. Markup Procedure: During construction, maintain a set of record prints of Contract Drawings and Shop Drawings for Project Record Document purposes.
 - 1. Mark these Drawings to show the actual installation where the installation varies from the installation shown originally. Give particular attention to information on

concealed elements that would be difficult to identify or measure and record later. Items required to be marked include, but are not limited to, the following:

- a. Dimensional changes to the Drawings.
 - b. Revisions to details shown on the Drawings.
 - c. Locations and depths of underground utilities.
 - d. Revisions to routing of piping and conduits.
 - e. Changes made by change order or Construction Change Directive.
 - f. Changes made following the Architect's written orders.
 - g. Details not on original Contract Drawings.
2. Mark record prints of Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. Where Shop Drawings are marked, show cross-reference on Contract Drawings location.
 3. Mark record sets with red. Use other colors to distinguish between changes for different categories of the Work at the same location.
 4. Mark important additional information that was either shown schematically or omitted from original Drawings.
 5. Note Construction Change Directive numbers, alternate numbers, change-order numbers, and similar identification.
- B. Responsibility for Markup: The individual or entity who obtained record data, whether the individual or entity is the Installer, subcontractor, or similar entity, shall prepare the markup on record drawings.
1. Accurately record information in an understandable drawing technique.
 2. Record data as soon as possible after obtaining it. Record and check the markup prior to enclosing concealed installations.
 3. At time of Substantial Completion, submit record drawings to the Architect for the Owner's records. Organize into sets and bind and label sets for the Owner's continued use.
- C. Preparation of As Built Drawings: Immediately prior to inspecting Certification of Substantial Completion, review completed marked-up record drawings with the Architect. When authorized, prepare a full set of corrected As-Built of Contract Drawings and Shop Drawings.
1. Incorporate changes and additional information previously marked on print sets. Erase, redraw, and add details (including any supplemental drawings from Architect/Engineer) and notations where applicable. Identify and date each drawing; include the printed designation "PROJECT RECORD DRAWINGS" in a prominent location on each drawing.
 2. Refer instances of uncertainty to the Architect for resolution.
 3. The Contractor is responsible for printing original Contract Drawings and other drawings as required to produce As-Built. The Architect will make original Contract Drawings available to the Contractor's print shop.

4. Where installations by 2 or more prime contractors are indicated on the same Drawing, the Contractor responsible for the principal installation, as determined by the Architect, is responsible for printing and distributing transparencies.
 - a. The Construction Manager is responsible for printing and distributing As-Builts where the Drawing covers installations of other prime contractors.
 5. Review of As-Builts: Before copying and distributing, submit original marked-up prints to the Architect for review.
- D. Copies and Distribution: Bind each set with durable-paper cover sheets. Include appropriate identification, including titles, dates, and other information on the cover sheets.
1. Organize and bind original marked-up set of prints that were maintained during the construction period in the same manner.
 2. Organize record drawings into sets matching the print sets. Place these sets in durable tube-type drawing containers with end caps. Mark the end cap of each container with suitable identification.
 3. Submit the marked-up record set, record drawings, and 3 copy sets to the Architect for the Owner's records; the Architect will retain 1 copy set.

1.3 RECORD SPECIFICATIONS

- A. During the construction period, maintain 2 copies of the Project Specifications, including addenda and modifications issued, for Project Record Document purposes.
1. Mark the Specifications to indicate the actual installation where the installation varies from that indicated in Specifications and modifications issued. Note related project record drawing information, where applicable. Give particular attention to substitutions, selection of product options, and information on concealed installations that would be difficult to identify or measure and record later.
 - a. In each Specification Section where products, materials, or units of equipment are specified or scheduled, mark the copy with the proprietary name and model number of the product furnished.
 - b. Record the name of the manufacturer, supplier, installer, and other information necessary to provide a record of selections made and to document coordination with record Product Data submittals and maintenance manuals.
 - c. Note related record Product Data, where applicable. For each principal product specified, indicate whether record Product Data has been submitted in maintenance manual instead of submitted as record Product Data.
 2. Upon completion of markup, submit record Specifications to the Architect for the Owner's records.
 3. Each prime contractor is responsible for marking up Sections that contain its own Work.

- a. The Construction Manager is responsible for collecting marked-up record Sections from each of the other prime contractors. The Construction Manager is also responsible for collating these Sections in proper numeric order with its own Sections to form a complete set of record Specifications.
- b. The Construction Manager is responsible for submitting the complete set of record Specifications as specified.

1.4 RECORD PRODUCT DATA

- A. During the construction period, maintain one copy of each Product Data submittal for Project Record Document purposes.
 1. Mark Product Data to indicate the actual product installation where the installation varies substantially from that indicated in Product Data submitted. Include significant changes in the product delivered to the site and changes in manufacturer's instructions and recommendations for installation.
 2. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 3. Note related Change Orders and markup of record Drawings, where applicable.
 4. Upon completion of markup, submit a complete set of record Product Data to the Architect for the Owner's records.
 5. Where record Product Data is required as part of maintenance manuals, submit marked-up Product Data as an insert in the manual instead of submittal as record Product Data.
 6. Each prime contractor is responsible for marking up and submitting record Product Data for its own Work.

1.5 RECORD SAMPLE SUBMITTAL

- A. Immediately prior to date of Substantial Completion meet with the Architect and the Owner's personnel at the site to determine which of the Samples maintained during the construction period shall be transmitted to the Owner for record purposes. Comply with the Architect's instructions for packaging, identification marking, and delivery to the Owner's Sample storage space. Dispose of other Samples in a manner specified for disposing surplus and waste materials.

1.6 MAINTENANCE MANUAL SUBMITTAL

- A. See other Specification Sections for requirements.

1.7 MISCELLANEOUS RECORD SUBMITTALS

- A. Refer to other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Immediately prior to Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for use and reference. Submit to the Architect for the Owner's records.
 - 1. Categories of requirements resulting in miscellaneous records include, but are not limited to, the following:
 - a. Field records on excavations and foundations.
 - b. Field records on underground construction and similar work.
 - c. Survey showing locations and elevations of underground lines.
 - d. Invert elevations of drainage piping.
 - e. Surveys establishing building lines and levels.
 - f. Authorized measurements utilizing unit prices or allowances.
 - g. Records of plant treatment.
 - h. Ambient and substrate condition tests.
 - i. Certifications received in lieu of labels on bulk products.
 - j. Batch mixing and bulk delivery records.
 - k. Testing and qualification of tradesmen.
 - l. Documented qualification of installation firms.
 - m. Load and performance testing.
 - n. Inspections and certifications by governing authorities.
 - o. Leakage and water-penetration tests.
 - p. Fire-resistance and flame-spread test results.
 - q. Final inspection and correction procedures.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 RECORDING

- A. Post changes and modifications to the Documents as they occur. Do not wait until the end of the Project.

END OF SECTION 01 72 00

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SECTION 01 73 00 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 REQUIREMENTS

- A. Format and content of manuals.
- B. Instruction of Owner's personnel.
- C. Schedule of submittals.

1.2 FORMAT

- A. Prepare data in the form of an instructional manual.
- B. Binders: Commercial quality, 8-1/2 x 11, three-ring binders with hardback, cleanable, vinyl covers.
- C. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; list title of Project; use volumes as needed.
- D. Arrange content by systems, process flow, under section numbers and sequence of Table of Contents of this Project Manual.
- E. Provide tabbed fly leaf for each separate project and system, with typed description of product and major component parts of equipment.
- F. Text: Manufacturer's printed data, or typewritten data.
- G. Drawings: Provide with reinforced pocket folders. Bind in with text; fold drawings; insert into pocket folders.

1.3 CONTENTS OF EACH VOLUME

- A. Table of Contents: Provide title of Project; names, addresses, and telephone numbers of Architect/Engineer and Contractor with name of responsible parties; schedule of products and systems, indexed to content of the volume.

- B. For Each Product or System: List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
- C. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information.
- D. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.
- E. Warranties and Bonds: Bind in copy of each.

1.4 MANUAL FOR MATERIALS AND FINISHES:

- A. Building Products, Applied Materials, and Finishes: Include product data, with catalog number, size, composition, color and texture designations. provide information for re-ordering custom manufactured products.
- B. Instructions for Care and Maintenance: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- C. Moisture-protection and Weather-exposed Products: Include product data listing applicable reference standards, chemical composition, and details of installation; delete inapplicable information.
- D. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.
- E. Warranties and Bonds: Bind in copy of each.

1.5 MANUAL FOR EQUIPMENT AND SYSTEMS:

- A. Each Item of Equipment and Each System: Include description of unit or system, and component parts. Give function, normal operating characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number or replaceable parts.
- B. Maintenance Requirements: Include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and checking instructions.
- C. Include manufacturer's printed operations and maintenance instructions.
- D. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- E. Include test reports as specified.

- F. Additional Requirements: As specified individual specifications sections.
- G. Provide a listing in Table of Contents for design data, with tabbed flysheet and space for insertion of data.

1.6 INSTRUCTION OF OWNER PERSONNEL:

- A. Before substantial inspection, instruct Owner's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems, at agreed upon times.
- B. Use operation and maintenance manuals as basis of instruction. Review contents of manual with personnel in detail to explain all aspects of operation and maintenance.
- C. Prepare and insert additional data in Operation and Maintenance Manual when need for such data become apparent during instruction.

1.7 SUBMITTALS

- A. Submit one (1) copy of completed volumes in final form 15 days prior to substantial inspection. Copy will be returned after substantial inspection, with Architect/Engineer comments. Revise content of documents as required prior to substantial submittal.
- B. Submit two (2) copies of revised volumes of data in substantial form within ten days after substantial inspection. If submitted electronically, only one (1) hard copy is required.

PART 2 - NOT USED

PART 3 - NOT USED

END OF SECTION 01 73 00

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SECTION 01 74 00 - WARRANTIES AND BONDS

PART 1 - GENERAL

1.1 REQUIREMENTS

- A. Preparation and submittal of warranties and bonds.
- B. Schedule of submittals.

1.2 FORMS OF SUBMITTAL

- A. Bind with operation and maintenance manuals.

1.3 PREPARATION OF SUBMITTALS

- A. Obtain warranties and bonds, executed in triplicate (3) by responsible subcontractors, suppliers, and manufacturers after completion of the applicable item of work. Date of beginning of time of warranty will be the Date of Substantial Completion.
- B. Verify that documents are in proper form, contain full information, and are notarized.
- C. Co-execute submittals when required.
- D. Retain warranties and bonds until time specified for submittal.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION

3.1 WARRANTY SERVICE

- A. The Contractor shall proceed with warranty repair or replacement within 24 hours of being notified that a warranty deficiency exists.
- B. In order to insure prompt and effective correction of warranty deficiencies, the Contractor shall, if he or any of his Subcontractors do not maintain fully staffed service organizations within 1 hour of the Project Site, designate firms within 1 hour of the Project Site authorized to perform warranty work on the Contractor's behalf. The name, addresses, and phone numbers of these

designated firms shall be included within the closeout documents, along with affidavits signed by officers of the designated firms stating that they have been retained and will perform required warranty service.

END OF SECTION 01 74 00

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SECTION 01 75 00 - SPARE PARTS AND MAINTENANCE MATERIALS

PART 1 - GENERAL

1.1 REQUIREMENTS

- A. Products required.
- B. Storage and delivery of products.

1.2 PRODUCTS REQUIRED

- A. Provide quantity of products, spare parts, maintenance tools, and maintenance materials specified in individual sections to be provided to Owner, in addition to that required for completion of Work.
- B. Products: Identical to those installed in the Work. Include quantities in original purchase from supplier or manufacturer to avoid variations in manufacture.

1.3 STORAGE AND MAINTENANCE

- A. Store products with products to be installed in the Work, under provisions of Section 01 60 00.
- B. Maintain spare products in original containers with labels intact and legible, until delivery to Owner.

1.4 DELIVERY

- A. Coordinate with Owner: Deliver and unload spare products to Owner at Project site and obtain receipt prior to final payment.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

END OF SECTION 01 75 00

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SECTION 02 41 19 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of building or structure.
2. Demolition and removal of selected site elements.

1.2 DEFINITIONS

- A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.
- B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse or store as directed by Owner.
- C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.
- E. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

1.3 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.

1.4 PREINSTALLATION MEETINGS

- A. Pre-demolition Conference: Conduct conference at Project site.
 1. Inspect and discuss condition of construction to be selectively demolished.
 2. Review structural load limitations of existing structure.
 3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
 4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
 5. Review areas where existing construction is to remain and requires protection.

1.5 INFORMATIONAL SUBMITTALS

- A. Engineering Survey: Submit engineering survey of condition of building.
- B. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and for noise control. Indicate proposed locations and construction of barriers.
- C. Schedule of Selective Demolition Activities: Indicate the following:
 - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity.
 - 2. Interruption of utility services. Indicate how long utility services will be interrupted.
 - 3. Coordination for shutoff, capping, and continuation of utility services.
 - 4. Use of elevator and stairs.
- D. Pre-demolition Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces, that might be misconstrued as damage caused by demolition operations.
- E. 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.
- F. Warranties: Documentation indicating that existing warranties are still in effect after completion of selective demolition.

1.6 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- C. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. Hazardous materials will be removed by Owner before start of the Work.
 - 2. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
- D. Hazardous Materials: Present in buildings and structures to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
 - 1. Hazardous material remediation is specified elsewhere in the Contract Documents.
 - 2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.

3. Owner will provide material safety data sheets for suspected hazardous materials that are known to be present in buildings and structures to be selectively demolished because of building operations or processes performed there.

E. Storage or sale of removed items or materials on-site is not permitted.

F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities in service during selective demolition operations.

1.7 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials and using approved contractors so as not to void existing warranties. Notify warrantor before proceeding.

B. Notify warrantor on completion of selective demolition, and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

1.8 COORDINATION

A. Arrange selective demolition schedule so as not to interfere with Owner's operations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.

C. Steel Tendons: Locate tensioned steel tendons and include recommendations for de-tensioning.

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

3.2 PREPARATION

- A. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.

- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.

1. Arrange to shut off utilities with utility companies.
2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.
 - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.
 - c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
 - d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
 - e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
 - f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
 - g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material and leave in place.

3.4 PROTECTION

- A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

1. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
2. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.

3. Cover and protect furniture, furnishings, and equipment that have not been removed.
- B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
 1. Strengthen or add new supports when required during progress of selective demolition.
- C. Remove temporary barricades and protections where hazards no longer exist.

3.5 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
 5. Maintain fire watch during and after flame-cutting operations.
 6. Maintain adequate ventilation when using cutting torches.
 7. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 8. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
 9. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 10. Dispose of demolished items and materials promptly.
- B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- C. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
 - 4. Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."
- B. Burning: Do not burn demolished materials.

3.7 CLEANING

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

END OF SECTION 02 41 19

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SECTION 04 81 00 - UNIT MASONRY ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concrete masonry units.
2. Mortar and grout.
3. Masonry joint reinforcement.
4. Ties and anchors.
5. Miscellaneous masonry accessories.

1.2 DEFINITIONS

- A. CMU(s): Concrete masonry unit(s).
- B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.3 PERFORMANCE REQUIREMENTS

- A. Provide structural unit masonry that develops indicated net-area compressive strengths at 28 days.
1. Determine net-area compressive strength of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) according to Tables 1 and 2 in ACI 530.1/ASCE 6/TMS 602.
 2. Determine net-area compressive strength of masonry by testing masonry prisms according to ASTM C 1314.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Product Data: For the following:
1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
 2. Reinforcing Steel: Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement
 3. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.
- C. Qualification Data: For testing agency.
- D. Material Certificates: For each type and size of the following:

1. Masonry units.
 - a. Include material test reports substantiating compliance with requirements.
 2. Cementitious materials. Include brand, type, and name of manufacturer.
 3. Grout mixes. Include description of type and proportions of ingredients.
 4. Anchors, ties, and metal accessories.
- E. Mix Designs: For each type of grout include description of type and proportions of ingredients.
1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C 109/C 109M for compressive strength, ASTM C 1506 for water retention, and ASTM C 91 for air content.
 2. Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.
- F. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined according to Tables 1 and 2 in ACI 530.1/ASCE 6/TMS 602.
- G. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM C 1093 for testing indicated.
- B. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.
- C. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.
- D. Masonry Standard: Comply with ACI 530.1/ASCE 6/TMS 602 unless modified by requirements in the Contract Documents.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

- D. Deliver preblended, dry mortar mix in moisture-resistant containers designed for use with dispensing silos. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in covered weatherproof dispensing silos.
- E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

PART 2 - PRODUCTS

2.1 MASONRY UNITS, GENERAL

- A. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects will be exposed in the completed Work.
- B. Fire-Resistance Ratings: Where indicated, provide units that comply with requirements for fire-resistance ratings indicated as determined by testing according to ASTM E 119, by equivalent masonry thickness, or by other means, as acceptable to authorities having jurisdiction.

2.2 CONCRETE MASONRY UNITS

- A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
- B. Integral Water Repellent: Provide units made with integral water repellent for exposed units.
 - 1. Integral Water Repellent: Liquid polymeric, integral water-repellent admixture that does not reduce flexural bond strength. Units made with integral water repellent, when tested according to ASTM E 514 as a wall assembly made with mortar containing integral water-repellent manufacturer's mortar additive, with test period extended to 24 hours, shall show no visible water or leaks on the back of test specimen.
 - a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) ACM Chemistries; RainBloc.
 - 2) BASF Aktiengesellschaft; Rheopel Plus.
 - 3) Grace Construction Products, W. R. Grace & Co. - Conn.; Dry-Block.
- C. CMUs: ASTM C 90.
 - 1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2150 psi (14.8 MPa) (minimum).
 - 2. Density Classification: Normal weight unless otherwise indicated.
 - 3. Size (Width): Manufactured to dimensions 3/8 inch less than nominal dimensions.
 - 4. Exposed Faces: Provide color and texture matching the range represented by Architect's sample.

2.3 BRICK

- A. Regional Materials: Provide brick that has been manufactured within 500 miles (800 km) of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles (800 km) of Project site.
- B. General: Provide shapes indicated and as follows, with exposed surfaces matching finish and color of exposed faces of adjacent units:
 - 1. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.
 - 2. Provide special shapes for applications where stretcher units cannot accommodate special conditions, including those at corners, movement joints, bond beams, sashes, and lintels.
 - 3. Provide special shapes for applications requiring brick of size, form, color, and texture on exposed surfaces that cannot be produced by sawing.
 - 4. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.
- C. Face Brick: Facing brick complying with ASTM C 216 or hollow brick complying with ASTM C 652, Class H40V (void areas between 25 and 40 percent of gross cross-sectional area).
 - 1. Products: Subject to compliance with requirements:
 - 2. Grade: SW.
 - 3. Type: HBX.
 - 4. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 3350 psi (23.10 MPa) minimum.
 - 5. Initial Rate of Absorption: Less than 30 g/30 sq. in. (30 g/194 sq. cm) per minute when tested per ASTM C 67.
 - 6. Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced."
 - 7. Surface Coating: Brick with colors or textures produced by application of coatings shall withstand 50 cycles of freezing and thawing per ASTM C 67 with no observable difference in the applied finish when viewed from 10 feet (3 m):
 - 8. Size (Actual Dimensions); Modular Type: 3-5/8 inches (92 mm) wide by 2-1/4 inches (57 mm) high by 7-5/8 inches (194 mm) long.
 - 9. Application: Use where brick is exposed unless otherwise indicated.
 - 10. Color and Texture: Match Existing Building.

2.4 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.
- D. Masonry Cement: ASTM C 91.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

- a. Capital Materials Corporation; Flamingo Color Masonry Cement.
- b. Cemex S.A.B. de C.V.; Brikset Type N Citadel Type S Dixie Type S Kosmortar Type N Richmortar Victor Plastic Cement.
- c. Holcim (US) Inc.; Mortamix Masonry Cement Rainbow Mortamix Custom Buff Masonry Cement White Mortamix Masonry Cement.
- d. Lafarge North America Inc.; Magnolia Masonry Cement Lafarge Masonry Cement Trinity White Masonry Cement.
- e. Lehigh Cement Company; Lehigh Masonry Cement Lehigh White Masonry Cement.
- f. National Cement Company, Inc.; Coosa Masonry Cement.

E. Mortar Cement: ASTM C 1329.

F. Aggregate for Mortar: ASTM C 144.

1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
2. For joints less than 1/4-inch (6 mm) thick, use aggregate graded with 100 percent passing the No. 16 (1.18-mm) sieve.
3. White-Mortar Aggregates: Natural white sand or crushed white stone.
4. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.

G. Aggregate for Grout: ASTM C 404.

H. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Euclid Chemical Company (The); Accelguard 80.
 - b. Grace Construction Products, W. R. Grace & Co. - Conn.; Morset.
 - c. Sonneborn Products, BASF Aktiengesellschaft; Trimix-NCA.

I. Water: Potable.

2.5 REINFORCEMENT

A. Masonry Joint Reinforcement, General: ASTM A 951/A 951M.

1. Exterior Walls: Hot dip galvanized, carbon steel.
2. Wire Size for Side Rods: 0.187-inch diameter.
3. Wire Size for Cross Rods: 0.187-inch diameter.

B. Masonry Joint Reinforcement for Single-Wythe Masonry: Either ladder or truss type with single pair of side rods.

2.6 TIES AND ANCHORS (As Needed)

A. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated.

1. Mill-Galvanized, Carbon-Steel Wire: ASTM A 82/A 82M; with ASTM A 641/A 641M, Class 1 coating.
2. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A 82/A 82M; with ASTM A 153/A 153M, Class B-2 coating.
3. Galvanized Steel Sheet: ASTM A 653/A 653M, Commercial Steel, G60 (Z180) zinc coating.
4. Steel Sheet, Galvanized after Fabrication: ASTM A 1008/A 1008M, Commercial Steel, with ASTM A 153/A 153M, Class B coating.

2.7 MISCELLANEOUS ANCHORS (As Needed)

A. Unit Type Inserts in Concrete: Cast-iron or malleable-iron wedge-type inserts.

1. Load Capacity: Capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.
2. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5 unless otherwise indicated.
3. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 (A1) Group 2 (A4) stainless-steel bolts, ASTM F 593 (ASTM F 738M), and nuts, ASTM F 594 (ASTM F 836M).

2.8 MISCELLANEOUS MASONRY ACCESSORIES (As needed)

- A. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805 or PVC, complying with ASTM D 2287, Type PVC-65406 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
- B. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).
- C. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells and hold reinforcing bars in center of cells. Units are formed from 0.148-inch (3.77-mm) steel wire, hot-dip galvanized after fabrication. Provide units designed for number of bars indicated.
 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Dayton Superior Corporation, Dur-O-Wal Division; D/A 810, D/A 812 or D/A 817.
 - b. Heckmann Building Products Inc.; No. 376 Rebar Positioner.
 - c. Hohmann & Barnard, Inc.; #RB or #RB-Twin Rebar Positioner.
 - d. Wire-Bond; O-Ring or Double O-Ring Rebar Positioner.

2.9 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.
 - 1. Do not use calcium chloride in mortar or grout.
 - 2. For exterior masonry, use portland cement-lime masonry cement or mortar cement mortar.
 - 3. For reinforced masonry, use portland cement-lime masonry cement or mortar cement mortar.
 - 4. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.
- B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
- C. Mortar for Unit Masonry: Comply with ASTM C 270, Property Specification. Provide the following types of mortar for applications stated unless another type is indicated or needed to provide required compressive strength of masonry.
 - 1. For masonry below grade or in contact with earth, use Type M.
 - 2. For reinforced masonry, use Type S.
 - 3. For exterior, above-grade, load-bearing and non-load-bearing walls and parapet walls; for interior load-bearing walls; for interior non-load-bearing partitions; and for other applications where another type is not indicated, use Type N.
- D. Pigmented Mortar: Use colored cement product or select and proportion pigments with other ingredients to produce color required. Do not add pigments to colored cement products.
 - 1. Pigments shall not exceed 10 percent of portland cement by weight.
 - 2. Pigments shall not exceed 5 percent of masonry cement or mortar cement by weight.
- E. Grout for Unit Masonry: Comply with ASTM C 476.
 - 1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 1.15.1 in ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.
 - 2. Proportion grout in accordance with ASTM C 476, Table 1 or paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi (14 MPa).
 - 3. Provide grout with a slump of 10 to 11 inches as measured according to ASTM C 143/C 143M.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of work.
 2. Verify that foundations are within tolerances specified.
 3. Verify that reinforcing dowels are properly placed.
- B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. (30 g/194 sq. cm) per minute when tested per ASTM C 67. Allow units to absorb water so they are damp but not wet at time of laying.

3.3 TOLERANCES

A. Lines and Levels:

1. For bed joints and top surfaces of bearing walls do not vary from level by more than 1/4 inch in 10 feet (6 mm in 3 m) maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet (3 mm in 3 m) maximum.
3. For vertical lines and surfaces do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m) maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet (3 mm in 3 m) maximum.
5. For lines and surfaces do not vary from straight by more than 1/4 inch in 10 feet (6 mm in 3 m) maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m) maximum.
7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch (1.5 mm) except due to warpage of masonry units within tolerances specified for warpage of units.

B. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm), with a maximum thickness.
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch (3 mm).
3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch (9 mm) or minus 1/4 inch (6 mm).
4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm). Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch (3 mm).
5. For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than 1/16 inch (1.5 mm) from one masonry unit to the next.

3.4 MORTAR BEDDING AND JOINTING

A. Lay hollow brick and CMUs as follows:

1. With face shells fully bedded in mortar and with head joints of depth equal to bed joints.
2. With webs fully bedded in mortar in all courses of piers, columns, and pilasters.
3. With webs fully bedded in mortar in grouted masonry, including starting course on footings.
4. With entire units, including areas under cells, fully bedded in mortar at starting course on footings where cells are not grouted.

B. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.

3.5 MASONRY JOINT REINFORCEMENT

A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch (16 mm) on exterior side of walls, 1/2 inch (13 mm) elsewhere. Lap reinforcement a minimum of 6 inches (150 mm).

1. Space reinforcement not more than 16 inches (406 mm) o.c.
2. Space reinforcement not more than 8 inches (203 mm) o.c. in foundation walls and parapet walls.
3. Provide reinforcement not more than 8 inches (203 mm) above and below wall openings and extending 12 inches (305 mm) beyond openings in addition to continuous reinforcement.

B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.

C. Provide continuity at wall intersections by using prefabricated T-shaped units.

D. Provide continuity at corners by using prefabricated L-shaped units.

E. Cut and bend reinforcing units as directed by manufacturer for continuity at corners, returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.6 ANCHORING MASONRY TO STRUCTURAL STEEL AND CONCRETE (As Needed)

A. Anchor masonry to structural steel and concrete where masonry abuts or faces structural steel or concrete to comply with the following:

1. Provide an open space not less than 1 inch (25 mm) wide between masonry and structural steel or concrete unless otherwise indicated. Keep open space free of mortar and other rigid materials.
2. Anchor masonry with anchors embedded in masonry joints and attached to structure.
3. Space anchors as indicated, but not more than 24 inches (610 mm) o.c. vertically and 36 inches (915 mm) o.c. horizontally.

3.7 REINFORCED UNIT MASONRY INSTALLATION

- A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
 - 1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
 - 2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other loads that may be placed on them during construction.
- B. Placing Reinforcement: Comply with requirements in ACI 530.1/ASCE 6/TMS 602.
- C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
 - 1. Comply with requirements in ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
 - 2. Limit height of vertical grout pours to not more than 60 inches (1520 mm) 12.67 ft. (3.86 m).

3.8 MASONRY WASTE DISPOSAL

- A. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 04 81 00

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**FLORIDA A&M UNIVERSITY
RATTLER POINT WASH HOUSE BUILD-OUT
CONSTRUCTION DOCUMENTS
SEPTEMBER 13, 2024**

SECTION 05 50 00 – MISCELLANEOUS METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following: (As shown and needed)
1. Steel framing and supports for countertops.
 2. Steel framing and supports for applications where framing and supports are not specified in other Sections.
 3. Shelf angles.
 4. Loose bearing and leveling plates.
 5. Steel weld plates and angles for casting into concrete not specified in other Sections.
 6. Miscellaneous steel trim including steel angle corner guards and steel edgings

1.2 PERFORMANCE REQUIREMENTS

- A. Thermal Movements: Provide exterior metal fabrications 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): 120 deg F ambient; 180 deg F material surfaces.

1.3 SUBMITTALS

- A. Shop Drawings: Show fabrication and installation details for metal fabrications.
1. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.
 2. Provide templates for anchors and bolts specified for installation under other Sections.
 3. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

- B. Mill Certificates: Signed by manufacturers of stainless-steel sheet certifying that products furnished comply with requirements.
- C. Welding certificates.
- D. Qualification Data: For professional engineer.

1.4 QUALITY ASSURANCE

- A. Welding: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1, "Structural Welding Code--Steel."
 - 2. AWS D1.2, "Structural Welding Code--Aluminum."
 - 3. AWS D1.3, "Structural Welding Code--Sheet Steel."
 - 4. AWS D1.6, "Structural Welding Code--Stainless Steel."

1.5 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication and indicate measurements on Shop Drawings.
 - 1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating metal fabrications without field measurements. Coordinate wall and other contiguous construction to ensure that actual dimensions correspond to established dimensions.
 - 2. Provide allowance for trimming and fitting at site.

1.6 COORDINATION

- A. Coordinate installation of anchorages for metal fabrications. 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.
- B. Coordinate installation of steel weld plates and angles for casting into concrete that are specified in this Section but required for work of another Section. Deliver such items to Project site in time for installation.

PART 2 - PRODUCTS

2.1 METALS, GENERAL

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces, unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

2.2 FERROUS METALS (As required)

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. in a Steel Tubing: ASTM A 500, cold-formed steel tubing.

2.3 NONFERROUS METALS (As called for)

- A. Aluminum Plate and Sheet: ASTM B 209 (ASTM B 209M), Alloy 6061-T6.
- B. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), Alloy 6063-T6.
- C. Aluminum-Alloy Rolled Tread Plate: ASTM B 632/B 632M, Alloy 6061-T6.
- D. Aluminum Castings: ASTM B 26/B 26M, Alloy 443.0-F.
- E. Bronze Plate, Sheet, Strip, and Bars: ASTM B 36/B 36M, Alloy UNS No. C28000 (muntz metal, 60 percent copper).
- F. Bronze Extrusions: ASTM B 455, Alloy UNS No. C38500 (extruded architectural bronze).
- G. Bronze Castings: ASTM B 584, Alloy UNS No. C83600 (leaded red brass) or No. C84400 (leaded semired brass).
- H. Nickel Silver Extrusions: ASTM B 151/B 151M, Alloy UNS No. C74500.
- I. Nickel Silver Castings: ASTM B 584, Alloy UNS No. C97600 (20 percent leaded nickel bronze).

2.4 FASTENERS (As Needed)

- A. General: Unless otherwise indicated, provide Type 304 316 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633, Class Fe/Zn 5, at exterior walls. Provide stainless-steel will fasteners for fastening aluminum. Select fasteners for type, grade, and class required.

- B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with hex nuts, ASTM A 563 (ASTM A 563M); and, where indicated, flat washers.
 - C. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, nuts and, where indicated, flat washers; ASTM F 593 (ASTM F 738M) for bolts and ASTM F 594 (ASTM F 836M) for nuts, Alloy Group **1 (A1) 2 (A4)**.
 - D. Anchor Bolts: ASTM F 1554, Grade 36.
 - 1. Provide hot-dip or mechanically deposited, zinc-coated anchor bolts where item being fastened is indicated to be galvanized.
 - E. Eyebolts: ASTM A 489.
 - F. Machine Screws: ASME B18.6.3 (ASME B18.6.7M).
 - G. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).
 - H. Wood Screws: Flat head, ASME B18.6.1.
 - I. Plain Washers: Round, ASME B18.22.1 (ASME B18.22M).
 - J. Lock Washers: Helical, spring type, ASME B18.21.1 (ASME B18.21.2M).
 - K. Cast-in-Place Anchors in Concrete: Anchors capable of sustaining, without failure, a load equal to four times the load imposed, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.
 - 1. Threaded or wedge type; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, hot-dip galvanized per ASTM A 153/A 153M.
 - L. Expansion Anchors: Anchor bolt and sleeve assembly with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.
 - 1. Material for Anchors in Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B 633, Class Fe/Zn 5.
- 2.5 MISCELLANEOUS MATERIALS (As Needed)
- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
 - B. Shop Primers: Provide primers that comply with Division 9 painting Sections.

- C. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79.
 - 1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.
- D. Zinc-Rich Primer: Complying with SSPC-Paint 20 or SSPC-Paint 29 and compatible with topcoat.
 - 1. Products:
 - a. Benjamin Moore & Co.; Epoxy Zinc-Rich Primer CM18/19.
 - b. Carboline Company; Carbozinc 621.
 - c. ICI Devco Coatings; Catha-Coat 313.
 - d. International Coatings Limited; Interzinc 315 Epoxy Zinc-Rich Primer.
 - e. PPG Architectural Finishes, Inc.; Aquapon Zinc-Rich Primer 97-670.
 - f. Sherwin-Williams Company (The); Corothane I GalvaPac Zinc Primer.
 - g. Tnemec Company, Inc.; Tneme-Zinc 90-97.
- E. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in steel, complying with SSPC-Paint 20.
- F. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.
- G. Nonshrink, Metallic Grout: Factory-packaged, ferrous-aggregate grout complying with ASTM C 1107, specifically recommended by manufacturer for heavy-duty loading applications.
- H. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- I. Concrete Materials and Properties: Comply with requirements in Division 3 Section "Cast-in-Place Concrete" for normal-weight, air-entrained, ready-mix concrete with a minimum 28-day compressive strength of 3000 psi (20 MPa), unless otherwise indicated.

2.6 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch, unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

- C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- D. Form exposed work true to line and level with accurate angles and surfaces and straight edges.
- E. Weld corners and seams continuously to comply with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts, unless otherwise indicated. Locate joints where least conspicuous.
- G. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
- I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.
 - 1. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches (3.2 by 38 mm), with a minimum 6-inch (150-mm) embedment and 2-inch (50-mm) hook, not less than 8 inches (200 mm) from ends and corners of units and 24 inches (600 mm) o.c., unless otherwise indicated.

2.7 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
- B. Fabricate units from steel shapes, plates, and bars of welded construction, unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction retained by framing and supports. Cut, drill, and tap units to receive hardware, hangers, and similar items.
 - 1. Furnish inserts if units are installed after concrete is placed.

- C. Fabricate supports for operable partitions from continuous steel beams of sizes indicated with attached bearing plates, anchors, and braces as indicated. Drill bottom flanges of beams to receive partition track hanger rods; locate holes where indicated on operable partition Shop Drawings.
- D. Galvanize miscellaneous framing and supports where indicated.
- E. Prime miscellaneous framing and supports with zinc-rich primer where indicated.

2.8 LOOSE BEARING AND LEVELING PLATES

- A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting.
- B. Galvanize plates after fabrication.

2.9 MISCELLANEOUS STEEL TRIM (As Needed)

- A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.
- B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.
 - 1. Provide with integrally welded steel strap anchors for embedding in concrete or masonry construction.
- C. Galvanize exterior miscellaneous steel trim.
- D. Prime interior miscellaneous steel trim, with zinc-rich primer.

2.10 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish metal fabrications after assembly.

2.11 STEEL AND IRON FINISHES

- A. Galvanizing: Hot-dip galvanize items as indicated to comply with applicable standard listed below:

1. ASTM A 123/A 123M, for galvanizing steel and iron products.
 2. ASTM A 153/A 153M, for galvanizing steel and iron hardware.
- B. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications:
1. Exteriors (SSPC Zone 1B) and Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 2. Interiors (SSPC Zone 1A): SSPC-SP 3, "Power Tool Cleaning."
- C. Shop Priming: Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finishes and those to be embedded in concrete, sprayed-on fireproofing, or masonry, unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

2.12 ALUMINUM FINISHES

- A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- B. As-Fabricated Finish: AA-M10 (Natural Finish: as fabricated, unspecified).

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- C. 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 no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- D. **Fastening to In-Place Construction:** Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag bolts, wood screws, and other connectors.
- E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- F. **Corrosion Protection:** Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood, or dissimilar metals with a heavy coat of bituminous paint.

3.2 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

- A. **General:** Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.
- B. Anchor supports for operable partitions securely to and rigidly brace from building structure.
- C. Support steel girders on solid grouted masonry, concrete, or steel pipe columns. Secure girders with anchor bolts embedded in grouted masonry or concrete or with bolts through top plates of pipe columns.
 1. Where grout space under bearing plates is indicated for girders supported on concrete or masonry, install as specified in "Installing Bearing and Leveling Plates" Article.
- D. Install pipe columns on concrete footings with grouted baseplates. Position and grout column baseplates as specified in "Installing Bearing and Leveling Plates" Article.
 1. Grout baseplates of columns supporting steel girders after girders are installed and leveled.

3.3 ADJUSTING AND CLEANING

- A. **Touchup Painting:** Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

1. Apply by brush or spray to provide a minimum 2.0-mil (0.05-mm) dry film thickness.
- B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Division 9 painting Sections.
- C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION 05 50 00

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SECTION 06 10 50 - MISCELLANEOUS CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Framing with dimension lumber.
2. Wood blocking.
3. Interior wood trim.
4. Plywood backing panels.

1.2 DEFINITIONS

A. Dimension Lumber: Lumber of 2 inches nominal or greater but less than 6 inches nominal in least dimension.

B. Lumber grading agencies, and the abbreviations used to reference them, include the following:

1. NeLMA: Northeastern Lumber Manufacturers' Association.
2. NHLA: National Hardwood Lumber Association.
3. NLGA: National Lumber Grades Authority.
4. SPIB: The Southern Pine Inspection Bureau.
5. WCLIB: West Coast Lumber Inspection Bureau.
6. WWPA: Western Wood Products Association.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

B. Deliver interior wood materials that are to be exposed to view only after building is enclosed and weatherproof, wet work other than painting is dry, and HVAC system is operating and maintaining temperature and humidity at occupancy levels.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
 - 1. Factory mark each piece of lumber with grade stamp of grading agency.
 - 2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
 - 3. Provide dressed lumber, S4S, unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

- A. Preservative Treatment by Pressure Process: AWPAC2, except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWPAC31 with inorganic boron (SBX).
 - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
 - 2. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
- D. Application: Treat items indicated on Drawings, and the following:
 - 1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
 - 2. Furring, stripping, and similar concealed members in contact with masonry or concrete.
 - 3. Wood floor plates that are installed over concrete slabs-on-grade.

2.3 DIMENSION LUMBER FRAMING (Where Called For)

- A. Maximum Moisture Content: 15 percent for 2-inch nominal thickness or less, 19 percent for more than 2-inch nominal thickness.
 - 1. Hem-fir (north); NLGA.
 - 2. Mixed southern pine; SPIB.
 - 3. Spruce-pine-fir; NLGA.
 - 4. Hem-fir; WCLIB, or WWPA.
 - 5. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.
 - 6. Douglas fir-larch (north); NLGA.
 - 7. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

2.4 MISCELLANEOUS LUMBER (As Needed)

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
 - 1. Blocking.
 - 2. Nailers.
 - 3. Rooftop equipment bases and support curbs.
 - 4. Furring.
 - 5. Grounds.
- B. For items of dimension lumber size, provide Construction or No. 2 grade lumber with 19 percent maximum moisture content of any species.
 - 1. Hem-fir (north); NLGA.
 - 2. Mixed southern pine; SPIB.
 - 3. Spruce-pine-fir; NLGA.
 - 4. Hem-fir; WCLIB, or WWPA.
 - 5. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

2.5 PLYWOOD BACKING PANELS

- A. Data/Com/I.T. and Electrical Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 1/2-inch nominal thickness.

2.6 FASTENERS (As Needed)

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.

1. Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M all.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: NES NER-272.
- D. Wood Screws: ASME B18.6.1.
- E. Screws for Fastening to Cold-Formed Metal Framing: ASTM C 954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.
- F. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).
- G. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.
- H. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 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.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.
- B. Framing Standard: Comply with AF&PA's "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- C. Metal Framing Anchors: Install metal framing to comply with manufacturer's written instructions.
- D. Do not splice structural members between supports, unless otherwise indicated.

- E. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
 - 1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches o.c.
- F. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:
 - 1. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal- vapid will be second thickness.
- G. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- H. Comply with AWWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
 - 1. Use inorganic boron for items that are continuously protected from liquid water.
 - 2. Use copper naphthenate for items not continuously protected from liquid water.
- I. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. NES NER-272 for power-driven fasteners.
 - 2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
 - 3. Table 23-II-B-1, "Nailing Schedule," and Table 23-II-B-2, "Wood Structural Panel Roof Sheathing Nailing Schedule," in ICBO's Uniform Building Code.
 - 4. Table 2305.2, "Fastening Schedule," in BOCA's BOCA National Building Code.
 - 5. Table 2306.1, "Fastening Schedule," in SBCCI's Standard Building Code.
 - 6. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.
 - 7. Table 602.3(1), "Fastener Schedule for Structural Members," and Table 602.3(2), "Alternate Attachments," in ICC's International One- and Two-Family Dwelling Code.
- J. Use common wire nails, unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; do not countersink nail heads, unless otherwise indicated.

3.2 WOOD BLOCKING, AND NAILER INSTALLATION

- A. Install where indicated and where required for screeding or attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.
- C. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

3.3 WOOD FURRING INSTALLATION

- A. Install minimum 2 x 6 wood blocking level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.
- B. Furring to Receive Plywood or Hardboard Paneling: Install 1-by-3-inch nominal- size furring horizontally and vertically at 24 inches o.c.
- C. Furring to Receive Gypsum Board: Install 1-by-2-inch nominal- size furring vertically at 16 inches o.c.

3.4 WOOD TRIM INSTALLATION

- A. Install with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Do not use pieces less than 24 inches long except where necessary. Stagger joints in adjacent and related standing and running trim. Cope at returns and miter at corners to produce tight-fitting joints with full-surface contact throughout length of joint. Use scarf joints for end-to-end joints.
 - 1. Match color and grain pattern across joints.
 - 2. Install trim after gypsum board joint-finishing operations are completed.
 - 3. Drill pilot holes in hardwood before fastening to prevent splitting. Fasten to prevent movement or warping. Countersink fastener heads and fill holes.
 - 4. Install to tolerance of 1/8 inch in 96 inches for level and plumb. Install adjoining finish carpentry with 1/32-inch maximum offset for flush installation and 1/16-inch maximum offset for reveal installation.

3.5 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
- B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 06 10 50

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SECTION 07 21 00 - BUILDING INSULATION

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Concealed building insulation.
 - 2. Sound attenuation insulation.

1.2 DEFINITIONS

- A. Mineral-Fiber Insulation: Insulation composed of rock-wool fibers, slag-wool fibers, or glass fibers; produced in boards and blanket with latter formed into batts (flat-cut lengths) or rolls.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency for insulation products.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of building insulation through one source from a single manufacturer.
- B. Fire-Test-Response Characteristics: Provide insulation and related 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. Identify materials with appropriate markings of applicable testing and inspecting agency.
 - 1. Surface-Burning Characteristics: ASTM E 84.
 - 2. Fire-Resistance Ratings: ASTM E 119.
 - 3. Combustion Characteristics: ASTM E 136.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.
- B. Protect plastic insulation as follows:
 - 1. Do not expose to sunlight, except to extent necessary for period of installation and concealment.
 - 2. Protect against ignition at all times. Do not deliver plastic insulating materials to Project site before installation time.
 - 3. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.

2.2 FOAM-PLASTIC BOARD INSULATION (where shown and called for)

- A. Extruded-Polystyrene Board Insulation: ASTM C 578, of type and density indicated below, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively: (Roof insulation)
 - 1. Manufacturers:
 - a. DiversiFoam Products.
 - b. Dow Chemical Company.
 - c. Owens Corning.
 - d. Pactiv Building Products Division.
 - 2. Type IV, 1.60 lb/cu. ft., unless otherwise indicated. (thickness as called for)
 - 3. Anchor per manufacturers recommendations for specified wind loads.

2.3 GLASS-FIBER BLANKET INSULATION

- A. Manufacturers:
 - 1. CertainTeed Corporation.

2. Guardian Fiberglass, Inc.
 3. Johns Manville.
 4. Knauf Fiber Glass.
 5. Owens Corning.
- B. Sound Batts – 4” minimum: Unfaced, Glass-Fiber Blanket Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics (sound batts) (4” min).
- C. Faced, Glass-Fiber Blanket Insulation: ASTM C 665, Type III (blankets with reflective membrane facing), Class A (membrane-faced surface with a flame-spread index of 25 or less); Category 1 (membrane is a vapor barrier), faced with foil-scrim-kraft or foil-scrim-polyethylene vapor-retarder membrane on 1 face.

2.4 INSULATION FASTENERS (As needed)

- A. 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. Products:
 - a. AGM Industries, Inc.; Series T TACTOO Insul-Hangers.
 - b. Eckel Industries of Canada; Stic-Klip Type N Fasteners.
 - c. Gemco; Spindle Type.
 2. Plate: Perforated galvanized carbon-steel sheet, 0.030 inch thick 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.
- B. Adhesively Attached, Angle-Shaped, Spindle-Type Anchors: Angle 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. Products:
 - a. Basis of Design: Gemco; 90-Degree Insulation Hangers.
 2. Angle: Formed from 0.030-inch- thick, perforated, galvanized carbon-steel sheet with each leg 2 inches square.
 3. Spindle: Copper-coated, low carbon steel; fully annealed; 0.105 inch in diameter; length to suit depth of insulation indicated.

- C. 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.
1. Products:
 - a. AGM Industries, Inc.; RC150.
 - b. AGM Industries, Inc.; SC150.
 - c. Gemco; Dome-Cap.
 - d. Gemco; R-150.
 - e. Gemco; S-150.
 2. Protect ends with capped self-locking washers incorporating a spring steel insert to ensure permanent retention of cap in the following locations:
 - a. Ceiling plenums.
 - b. Attic spaces.
 - c. Where indicated.
- D. Anchor Adhesive: Product with demonstrated capability to bond insulation anchors securely to substrates indicated without damaging insulation, fasteners, and substrates.
1. Products:
 - a. AGM Industries, Inc.; TACTOO Adhesive.
 - b. Eckel Industries of Canada; Stic-Klip Type S Adhesive.
 - c. Gemco; Tuff Bond Hanger Adhesive.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements of Sections in which substrates and related work are specified and for other conditions affecting performance.
1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrates of substances harmful to insulation or vapor retarders, including removing projections capable of puncturing vapor retarders or of interfering with insulation attachment.

3.3 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and application indicated.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed at any time to ice, rain, and snow.
- C. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Water-Piping Coordination: If water piping is located within insulated exterior walls, coordinate location of piping to ensure that it is placed on warm side of insulation and insulation encapsulates piping.
- E. For preformed insulating units, provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.

3.4 INSTALLATION OF GENERAL BUILDING INSULATION

- A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.
- B. Seal joints between foam-plastic insulation units by applying adhesive, mastic, or sealant to edges of each unit to form a tight seal as units are shoved into place. Fill voids in completed installation with adhesive, mastic, or sealant as recommended by insulation manufacturer.
- C. Set vapor-retarder-faced units with vapor retarder to warm-in-winter side of construction, unless otherwise indicated.
 - 1. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to surrounding construction to ensure airtight installation.
- D. Install mineral-fiber insulation in cavities formed by framing members according to the following requirements:
 - 1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill cavity, provide lengths that will produce a snug fit between ends.
 - 2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.

3. Maintain 3-inch clearance of insulation around recessed lighting fixtures.
4. Install eave ventilation troughs between roof framing members in insulated attic spaces at vented eaves.
5. For metal-framed wall cavities where cavity heights exceed 96 inches, support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.

3.5 INSTALLATION OF INSULATION IN CEILINGS AND WALLS FOR SOUND ATTENUATION

- A. Install 4-inch-thick ASTM C665, Type I unfaced glass fiber blanket insulation (produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool or rock wool) over suspended ceilings at partitions in a width that extends insulation 48 inches on either side of partition.
 1. Fire Resistive Rated Assemblies: Comply with mineral-fiber requirements of assembly.

3.6 PROTECTION

- A. Protect installed insulation and vapor retarders from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 07 21 00

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SECTION 073113 - ASPHALT SHINGLES (ALTERNATE)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Asphalt shingles.
 - 2. Underlayment.
 - 3. Metal flashing and trim.

1.3 PREINSTALLATION MEETINGS

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

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified.
 - 1. Asphalt Shingles: Full size.
 - 2. Ridge and Hip Cap Shingles: Full size.
 - 3. Exposed Valley Lining: 12 inches (300 mm) square.
- C. Samples for Initial Selection: For each type of asphalt shingle indicated.
 - 1. Include similar Samples of accessories involving color selection.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Sample Warranty: For manufacturer's warranty.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For asphalt shingles to include in maintenance manuals.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Asphalt Shingles: 100 sq. ft. (9.3 sq. m) of each type, in unbroken bundles.

1.8 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Store roofing materials in a dry, well-ventilated location protected from weather, sunlight, and moisture according to manufacturer's written instructions.
- B. Store underlayment rolls on end on pallets or other raised surfaces. Do not double stack rolls.
- C. Protect unused roofing materials from weather, sunlight, and moisture when left overnight or when roofing work is not in progress.
- D. Handle, store, and place roofing materials in a manner to prevent damage to roof deck or structural supporting members.

1.10 FIELD CONDITIONS

- A. Environmental Limitations: Install self-adhering sheet underlayment within the range of ambient and substrate temperatures recommended in writing by manufacturer.

1.11 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace asphalt shingles that fail within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Manufacturing defects.
 - 2. Material Warranty Period: 40 years from date of Substantial Completion, prorated, with first five years nonprorated.
 - 3. Wind-Speed Warranty Period: Asphalt shingles will resist blow-off or damage caused by wind speeds of up minimum 130 mph (58 m/s) for five years from date of Substantial Completion.
 - 4. Algae-Resistance Warranty Period: Asphalt shingles will not discolor for 10 years from date of Substantial Completion.
 - 5. Workmanship Warranty Period: 25 years from date of Substantial Completion.
- B. Roofing Installer's Warranty: On warranty form at end of this Section, signed by Installer, in which Installer agrees to repair or replace components of asphalt-shingle roofing that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Exterior Fire-Test Exposure: Provide asphalt shingles and related roofing materials identical to those of assemblies tested for Class A fire resistance according to ASTM E 108 or UL 790 by Underwriters Laboratories or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.

2.2 GLASS-FIBER-REINFORCED ASPHALT SHINGLES

- A. Laminated-Strip Asphalt Shingles: ASTM D 3462/D 3462M, laminated, multi-ply overlay construction, glass-fiber reinforced, mineral-granule surfaced, and self-sealing.
 - 1. Provide one of the following:
 - a. GAF, Timberline
 - b. Certainteed, Landmark TL
 - c. Owens Corning, Duration Series
 - d. Atlas, Pinnacle Pristine
 - 2. Butt Edge: Straight, Notched or Crenelated cut.
 - 3. Strip Size: Manufacturer's standard.

4. Algae Resistance: Granules resist algae discoloration.
 5. Impact Resistance: UL 2218, Class 4.
 6. Color and Blends: As selected by Architect from manufacturer's full range.
- B. Hip and Ridge Shingles: Self-sealing hip and ridge cap shingle matching the color of selected roof shingle.
- C. Starter Strips: Self-sealing starterstrip designed for selected roof shingle.

2.3 UNDERLAYMENT MATERIALS

- A. Self-Adhering Sheet Underlayment, Polyethylene Faced: ASTM D 1970/D 1970M, minimum of 40-mil- (1.0-mm-) thick, slip-resisting, polyethylene-film-reinforced top surface laminated to SBS-modified asphalt adhesive, with release backing; cold applied. Provide primer for adjoining concrete or masonry surfaces to receive underlayment.
1. Provide one of the following:
 - a. GAF, StormGuard
 - b. GCP Applied Technologies; Grace Ice and Water Shield
 - c. Owens Corning; Weather lock
 - d. Atlas; Weather Master
 2. Thermal Stability: Stable after testing at 240 deg F (116 deg C) according to ASTM D 1970/D 1970M.
 3. Low-Temperature Flexibility: Passes after testing at minus 20 deg F (29 deg C) according to ASTM D 1970/D 1970M.

2.4 ACCESSORIES

- A. Asphalt Roofing Cement: ASTM D 4586, Type II, asbestos free.
- B. Roofing Nails: ASTM F 1667; aluminum, stainless-steel, copper, or hot-dip galvanized-steel wire shingle nails, minimum 0.120-inch- (3-mm-) diameter, sharp-pointed, with a minimum 3/8-inch- (9.5-mm-) diameter flat head and of sufficient length to penetrate 3/4 inch (19 mm) into solid wood decking or extend at least 1/8 inch (3 mm) through OSB or plywood sheathing.
1. Shank: Barbed.
 2. Where nails are in contact with metal flashing, use nails made from same metal as flashing.
- C. Underlayment Fasteners: As recommended in writing by synthetic-underlayment manufacturer for application indicated.

2.5 METAL FLASHING AND TRIM

- A. General: Comply with requirements in Division 7 Section "Sheet Metal Flashing and Trim."
 - 1. Sheet Metal: Stainless steel, Anodized aluminum, or Aluminum, mill finished
- B. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of the item.
 - 1. Apron Flashings: Fabricate with lower flange a minimum of 5 inches (125 mm) over and 4 inches (100 mm) beyond each side of downslope asphalt shingles and 6 inches (150 mm) up the vertical surface.
 - 2. Step Flashings: Fabricate with a headlap of 2 inches (50 mm) and a minimum extension of 4 inches (100 mm) over the underlying asphalt shingle and up the vertical surface.
 - 3. Cricket or Backer Flashings: Fabricate with concealed flange extending a minimum of 24 inches (600 mm) beneath upslope asphalt shingles and 6 inches (150 mm) beyond each side and 6 inches (150 mm) above the roof plane.
 - 4. Open-Valley Flashings: Fabricate in lengths not exceeding 10 feet (3 m) <Insert dimension> with 1-inch- (25-mm-) high, inverted-V profile at center of valley and equal flange widths of 12 inches (300 mm) .
 - 5. Drip Edges: Fabricate in lengths not exceeding 10 feet (3 m) with 2-inch (50-mm) roof-deck flange and 1-1/2-inch (38-mm) fascia flange with 3/8-inch (9.5-mm) drip at lower edge.
- C. Vent Pipe Flashings: ASTM B 749, Type L51121, at least 1/16 inch (1.6 mm) thick. Provide lead sleeve sized to slip over and turn down into pipe, soldered to skirt at slope of roof, and extending at least 4 inches (100 mm) from pipe onto roof.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
 - 1. Examine roof sheathing to verify that sheathing joints are supported by framing and blocking or metal clips and that installation is within flatness tolerances.
 - 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored; and that provisions have been made for flashings and penetrations through asphalt shingles.

- B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION

- A. General: Comply with underlayment manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.
- B. Self-Adhering Sheet Underlayment: Install, wrinkle free, on roof deck. Comply with low-temperature installation restrictions of underlayment manufacturer if applicable. Install lapped in direction that sheds water. Lap sides not less than 3-1/2 inches (89 mm). Lap ends not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses. Roll laps with roller. Cover underlayment within seven days.
 - 1. Prime concrete and masonry surfaces to receive self-adhering sheet underlayment.
 - 2. Eaves: Extend from edges of eaves 24 inches (600 mm) beyond interior face of exterior wall.
 - 3. Rakes: Extend from edges of rake 24 inches (600 mm) beyond interior face of exterior wall.
 - 4. Valleys: Extend from lowest to highest point 18 inches (450 mm) on each side.
 - 5. Hips: Extend 18 inches (450 mm) on each side.
 - 6. Ridges: Extend 36 inches (914 mm) on each side.
 - 7. Sidewalls: Extend beyond sidewall 18 inches (450 mm), and return vertically against sidewall not less than 4 inches (100 mm).
 - 8. Roof Slope Transitions: Extend 18 inches (450 mm) on each roof slope.
- C. Concealed Valley Lining: For woven. Comply with NRCA's "NRCA Guidelines for Asphalt Shingle Roof Systems." Install underlayment centered in valley and fastened to roof deck.
 - 1. Lap roof-deck underlayment over valley underlayment at least 6 inches (150 mm).
 - 2. Install a full-width sheet of synthetic underlayment centered in valley. Lap ends of strips at least 12 inches (300 mm) in direction to shed water, and seal with asphalt roofing cement. Fasten to roof deck.

3.3 METAL FLASHING INSTALLATION

- A. General: Install metal flashings and other sheet metal to comply with requirements in Division 7 Section "Sheet Metal Flashing and Trim."
 - 1. Install metal flashings according to recommendations in ARMA's "Residential Asphalt Roofing Manual" and NRCA's "NRCA Guidelines for Asphalt Shingle Roof Systems."

- B. Apron Flashings: Extend lower flange over and beyond each side of downslope asphalt shingles and up the vertical surface.
- C. Step Flashings: Install with a headlap of 2 inches (50 mm) and extend over the underlying asphalt shingle and up the vertical surface. Fasten to roof deck only.
- D. Cricket or Backer Flashings: Install against the roof-penetrating element extending concealed flange beneath upslope asphalt shingles and beyond each side.
- E. Open-Valley Flashings: Install centered in valleys, lapping ends at least 8 inches (200 mm) in direction to shed water. Fasten upper end of each length to roof deck beneath overlap.
 - 1. Secure hemmed flange edges into metal cleats spaced 12 inches (300 mm) apart and fastened to roof deck.
 - 2. Adhere 9-inch- (225-mm-) wide strip of self-adhering sheet to metal flanges and to self-adhering sheet underlayment.
- F. Rake Drip Edges: Install rake drip-edge flashings over underlayment and fasten to roof deck.
- G. Eave Drip Edges: Install eave drip-edge flashings below underlayment and fasten to roof sheathing.
- H. Pipe Flashings: Form flashing around pipe penetrations and asphalt shingles. Fasten and seal to asphalt shingles as recommended by manufacturer.

3.4 ASPHALT-SHINGLE INSTALLATION

- A. General: Install asphalt shingles according to manufacturer's written instructions, recommendations in ARMA's "Residential Asphalt Roofing Manual," and recommendations in NRCA's "NRCA Guidelines for Asphalt Shingle Roof Systems."
- B. Install starter strip along lowest roof edge, consisting of an asphalt-shingle strip 7 inches (175 mm) wide with self-sealing strip face up at roof edge.
 - 1. Extend asphalt shingles 1/2 inch (13 mm) 3/4 inch (19 mm) over fasciae at eaves and rakes.
 - 2. Install starter strip along rake edge.
- C. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.
- D. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.

- E. Install asphalt shingles by single-strip column or racking method, maintaining uniform exposure. Install full-length first course followed by cut second course, repeating alternating pattern in succeeding courses.
- F. Fasten asphalt-shingle strips with a minimum recommended number of roofing nails located according to manufacturer's written instructions.
 - 1. Where roof slope exceeds 21:12, seal asphalt shingles with asphalt roofing cement spots after fastening with additional roofing nails.
 - 2. Where roof slope is less than 4:12, seal asphalt shingles with asphalt roofing cement spots.
 - 3. When ambient temperature during installation is below 50 deg F (10 deg C), seal asphalt shingles with asphalt roofing cement spots.
- G. Woven Valleys: Extend succeeding asphalt-shingle courses from both sides of valley 12 inches (300 mm) beyond center of valley, weaving intersecting shingle-strip courses over each other. Use one-piece shingle strips without joints in valley.
 - 1. Do not nail asphalt shingles within 6 inches (150 mm) of valley center.
- H. Hip and Ridge Shingles: Maintain same exposure of cap shingles as roofing shingle exposure. Lap cap shingles at ridges to shed water away from direction of prevailing winds. Fasten with roofing nails of sufficient length to penetrate sheathing.
 - 1. Fasten ridge cap asphalt shingles to cover ridge vent without obstructing airflow.

3.5 ROOFING INSTALLER'S WARRANTY

- A. WHEREAS <Insert name> of <Insert address>, herein called the "Roofing Installer," has performed roofing and associated work ("the work") on the following project:
 - 1. Owner: <Insert name of Owner>.
 - 2. Address: <Insert address>.
 - 3. Building Name/Type: <Insert information>.
 - 4. Address: <Insert address>.
 - 5. Area of the Work: <Insert information>.
 - 6. Acceptance Date: <Insert date>.
 - 7. Warranty Period: <Insert time>.
 - 8. Expiration Date: <Insert date>.
- B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant the work against leaks and faulty or defective materials and workmanship for designated Warranty Period,
- C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of the work as are necessary to

correct faulty and defective work and as are necessary to maintain the work in a watertight condition.

D. This Warranty is made subject to the following terms and conditions:

1. Specifically excluded from this Warranty are damages to the work and other parts of the building, and to building contents, caused by:
 - a. Lightning;
 - b. Wind Gust;
 - c. Fire;
 - d. Failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
 - e. Faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
 - f. Vapor condensation on bottom of roofing; and
 - g. Activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
2. When the work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
3. Roofing Installer is responsible for damage to the work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of the work.
4. During Warranty Period, if Owner allows alteration of the work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of the alterations, but only to the extent the alterations affect the work covered by this Warranty. If Owner engages Roofing Installer to perform the alterations, Warranty shall not become null and void unless Roofing Installer, before starting the alterations, notified Owner in writing, showing reasonable cause for claim, that the alterations would likely damage or deteriorate the work, thereby reasonably justifying a limitation or termination of this Warranty.
5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a use or service more severe than originally specified, this Warranty shall become null and void on date of the change, but only to the extent the change affects the work covered by this Warranty.
6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect the work and to examine evidence of such leaks, defects, or deterioration.

7. This Warranty is recognized to be the only warranty of Roofing Installer on the work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of the work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

E. IN WITNESS THEREOF, this instrument has been duly executed this <Insert day> day of <Insert month>, <Insert year>.

1. Authorized Signature: <Insert signature>.
2. Name: <Insert name>.
3. Title: <Insert title>.

END OF SECTION 07 31 13

**FLORIDA A&M UNIVERSITY
RATTLER POINT WASH HOUSE BUILD-OUT
CONSTRUCTION DOCUMENTS
SEPTEMBER 13, 2024**

SECTION 07 46 46 - FIBER-CEMENT SIDING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Fiber-cement siding.
- B. Fiber-cement soffit panels.

1.02 REFERENCE STANDARDS

- A. ASTM C1186 - Standard Specification for Flat Fiber-Cement Sheets 2022.

1.03 SUBMITTALS

- A. Product Data: Submit manufacturer's data sheets on each product to be used, including:
 - 1. Manufacturer's requirements for related materials to be installed by others.
 - 2. Preparation instructions and recommendations.
 - 3. Storage and handling requirements and recommendations.
 - 4. Installation methods, including nail patterns.
- B. Manufacturer's qualification statement.
- C. Installer's qualification statement.
- D. Maintenance Instructions: Periodic inspection recommendations and maintenance procedures.
- E. Warranty: Submit copy of manufacturer's warranty, made out in Owner's name, showing that it has been registered with manufacturer.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of type specified in this section with not less than three years of experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store materials in manufacturer's unopened packaging, with labels intact, until ready for installation.
- B. Store materials under dry and waterproof cover, well ventilated, and elevated above grade on a flat surface.
- C. Protect materials from harmful environmental elements, construction dust, and other potentially detrimental conditions.

1.06 FIELD CONDITIONS

- A. Do not install panels when air temperature or relative humidity are outside manufacturer's limits.

1.07 WARRANTY

- A. Manufacturer Warranty: Provide manufacturer warranty for years as indicated under Fiber-Cement Siding article sub-headings for "Warranty". Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 FIBER-CEMENT SIDING

- A. Lap Siding: Individual horizontal boards made of cement and cellulose fiber formed under high pressure with integral surface texture, complying with ASTM C1186, Type A, Grade II; with machined edges, for nail attachment.
 - 1. Style: Standard lap style.
 - 2. Texture: Smooth.
 - 3. Length: 12 feet, nominal.
 - 4. Width (Height): 8-1/4 inches.
 - 5. Thickness: 5/16 inch, nominal.
 - 6. Finish: Factory applied primer.
 - 7. Color: To be chosen by Architect with all other paint colors..
 - 8. Warranty: 30 year limited; transferable.
 - 9. Subject to compliance with requirements, manufacturers offering products which may be included into the Work include, but are not limited to the following:
 - a. Allura, a division of Plycem USA, Inc: www.allurausa.com/#sle.
 - b. James Hardie Building Products, Inc; Basis of Design: Hardie Plank Lap Siding - Smooth: www.jameshardie.com/#sle.
 - c. Nichiha USA, Inc: www.nichiha.com/#sle.

2.02 FIBER-CEMENT SOFFIT

- A. Nominal Thickness: Not less than 5/16 inch.
- B. Pattern: 24-inch wide sheets with smooth texture.
- C. Ventilation: Provide unperforated soffit [**unless otherwise indicated**].
- D. Factory Priming: Manufacturer's standard acrylic primer.

2.03 ACCESSORIES

- A. Trim: Same material and texture as siding.
- B. Fasteners: Galvanized or corrosion resistant; length as required to penetrate, 1-1/4 inches, minimum.
 - 1. Coordinate fastener type, size and length with siding and ICF Manufacturers to achieve wind load rating as specified by Structural.
- C. Finish Paint: Latex house paint acceptable to siding manufacturer; primer recommended by paint manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine substrate, clean and repair as required to eliminate conditions that would be detrimental to proper installation.
- B. Do not begin until unacceptable conditions have been corrected.
- C. If substrate preparation is responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

- A. Protect surrounding areas and adjacent surfaces during execution of this work.
- B. Install Sheet Metal Flashing:
 - 1. Above door and window trim and casings.
 - 2. Above horizontal trim in field of siding.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions and recommendations.
 - 1. Read warranty and comply with terms necessary to maintain warranty coverage.
 - 2. Use trim details as indicated on drawings.
 - 3. Touch up field cut edges before installing.
 - 4. Pre-drill nail holes if necessary to prevent breakage.
- B. Over Insulated Concrete Forming (ICF): Fasten siding to internal furring strips.
- C. Allow space for thermal movement between both ends of siding panels that butt against trim; seal joint between panel and trim with specified sealant.
- D. Joints in Horizontal Siding: Avoid joints in lap siding except at corners; where joints are inevitable stagger joints between successive courses.
- E. Do not install siding less than 6 inches from ground surface, or closer than 1 inch to roofs, patios, porches, and other surfaces where water may collect.
- F. After installation, seal joints except lap joints of lap siding; seal around penetrations, and paint exposed cut edges.
- G. Finish Painting: Within one week after installation, paint siding and trim with one coat primer and two coats finish paint.

3.04 CLEANING

- A. Clean faced panels in accordance with manufacturer's maintenance instructions, using cleaning materials and methods acceptable to manufacturer.

3.05 PROTECTION

- A. Protect installed products until Date of Substantial Completion.
- B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION 07 46 46

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RATTLER POINT WASH HOUSE BUILD-OUT
CONSTRUCTION DOCUMENTS
SEPTEMBER 13, 2024**

SECTION 07 62 00 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Manufactured Products:
 - a. Manufactured through-wall flashing and counterflashing.

1.2 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal flashing and trim assemblies as indicated shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
- B. Wind speed: 130 mph
- C. Thermal Movements: Provide sheet metal flashing and trim that allows for thermal movements from ambient and surface temperature changes.
 1. Temperature Change (Range): 120 deg F (67 deg C), material surfaces.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.
- B. Shop Drawings: Show fabrication and installation layouts of sheet metal flashing and trim, including plans, elevations, and keyed details. Distinguish between shop- and field-assembled work. Include the following:
 1. Identification of 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 joining, supporting, and securing sheet metal flashing and trim, including layout of fasteners, cleats, clips, and other attachments. Include pattern of seams.
 4. Details of termination points and assemblies, including fixed points.
 5. Details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counterflashings as applicable.
- C. Samples for Initial Selection: For each type of sheet metal flashing, trim, and accessory indicated with factory-applied color finishes involving color selection.
- D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:
1. Sheet Metal Flashing: 12 inches (300 mm) long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
 2. Trim, Metal Closures, Expansion Joints, Joint Intersections, and Miscellaneous Fabrications: 12 inches (300 mm) long and in required profile. Include fasteners and other exposed accessories.
 3. Accessories and Miscellaneous Materials: Full-size Sample.
- E. Qualification Data: For qualified fabricator.
- F. Maintenance Data: For sheet metal flashing, trim, and accessories to include in maintenance manuals.
- G. Warranty: Sample of special warranty.

1.4 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.
- B. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" unless more stringent requirements are specified or shown on Drawings.
- C. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and set quality standards for fabrication and installation.
1. Build mockup of typical room edge, including fascia, gutter and downspout, approximately 5 feet long, including supporting construction, seams, attachments, underlayment 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.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
- B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to the extent necessary for the period of sheet metal flashing and trim installation.

1.6 WARRANTY

- A. Special Warranty on Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
 1. Exposed Panel 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 date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying a strippable, temporary protective film before shipping.
 1. Exposed Coil-Coated Finishes:
 - a. Two-Coat Fluoropolymer: AAMA 620. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

2. Color: As selected by Architect from manufacturer's full range
3. Concealed Finish: 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 (0.013 mm).

B. Aluminum Sheet: ASTM B209 (ASTM B 209M), alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required (min. 0.032 thickness).

1. Surface: Smooth, flat.
2. Factory finished.

2.2 MISCELLANEOUS MATERIALS (As needed)

A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.

B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.

1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
 - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating.
 - b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
 - c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
2. Fasteners for Aluminum Sheet: according to ASTM A 153/A 153M or ASTM F 2329 or Series 300 stainless steel.

C. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.

D. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane, polysulfide, or silicone polymer sealant; low modulus; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

E. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

- F. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.
- G. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.
- H. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.3 MANUFACTURED SHEET METAL FLASHING AND TRIM (Where shown and needed)

- A. Through-Wall Ribbed Sheet Metal Flashing: Manufacture through-wall sheet metal flashing for embedment in masonry with ribs at 3-inch (75-mm) intervals along length of flashing to provide an integral mortar bond. Manufacture through-wall flashing with interlocking counterflashing on exterior face, of same metal as reglet.

2.4 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, geometry, metal thickness, and other characteristics of item indicated. Fabricate items at the shop to greatest extent possible.
 1. 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.
 2. Obtain field measurements for accurate fit before shop fabrication.
 3. Form sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
 4. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces exposed to view.
- B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines as indicated and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.
- C. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."
- D. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant.

- E. Expansion Provisions: Where lapped expansion provisions cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.
- F. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- G. Fabricate cleats and attachment devices of sizes as recommended by SMACNA's "Architectural Sheet Metal Manual" and by FMG Loss Prevention Data Sheet 1-49 for application, but not less than thickness of metal being secured.
- H. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- I. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.
- J. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints where necessary for strength.
- K. Do not use graphite pencils to mark metal surfaces.

2.5 ROOF-EDGE DRAINAGE SYSTEMS

- A. Gutters: Manufactured in uniform section lengths not exceeding 12 feet with matching corner units, ends, outlet tubes and other accessories. Furnish flat-stock gutter straps, gutter brackets, expansion joints and expansion-joint covers fabricated from same metal as gutters.
 - 1. Aluminum Sheet: 0.063 inch thick.
 - 2. Gutter Profile: As indicated on drawings according to SMACNA's "Architectural Sheet Metal Manual."
- B. Downspouts: Plain rectangular complete with smooth curve elbows, manufactured from the following exposed metal. Furnish with metal hangers, from same material as downspouts and anchors.
- C. Parapet Scuppers: Manufactured with closure flange trim to exterior, 4-inch wide wall flanges to interior and base extending 4 inches beyond can't be tapered strip into field of roof.
 - 1. Formed Aluminum: 0.032 inch thick.
- D. Conductor Heads: Manufactured conductor heads, each with flanged back and stiffened top edge, and of dimensions and shape indicated, complete with outlet tube that nests into upper end of downspout, exterior flange trim and built-in overflow.
 - 1. Formed Aluminum: 0.032 inch thick

- E. Downspout Shoes (boot): Cast iron with 5/8" fastening lug slots for use between sheet metal downspout and storm water drainage system.
 - 1. Products: Subject to compliance with requirements available products that may be incorporated into the work include, but are not limited to, the following:
 - a. Neenah Founding: Basis of design – R-4926-29 Series.
 - b. Jay R. Smith
 - c. J.R. Hoe

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions and other conditions affecting performance of the Work.
 - 1. Verify compliance with requirements for installation tolerances of substrates.
 - 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
- B. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
 - 1. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
 - 2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
 - 3. Space cleats not more than 12 inches (300 mm) apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.
 - 4. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
 - 5. Install sealant tape where indicated.
 - 6. Torch cutting of sheet metal flashing and trim is not permitted.
 - 7. Do not use graphite pencils to mark metal surfaces.

- B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by SMACNA.
1. Coat back side of sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.
 2. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet or install a course of polyethylene sheet.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (600 mm) of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with sealant concealed within joints.
- D. Seal joints as shown and as required for watertight construction.
1. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1 inch (25 mm) into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F (4 deg C).
 2. Prepare joints and apply sealants to comply with requirements in Division 7 Section "Joint Sealants."
- E. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches (38 mm), except reduce pre-tinning where pre-tinned surface would show in completed Work.
1. Do not solder aluminum sheet.
 2. Pre-tinning is not required for zinc-tin alloy-coated stainless steel and zinc-tin alloy-coated copper.
 3. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
 4. Stainless-Steel Soldering: Tin edges of uncoated sheets using solder recommended for stainless steel and acid flux. Promptly remove acid flux residue from metal after tinning and soldering. Comply with solder manufacturer's recommended methods for cleaning and neutralization.
 5. Copper Soldering: Tin edges of uncoated copper sheets using solder for copper.
- F. Rivets: Rivet joints in uncoated aluminum where indicated and where necessary for strength.

3.3 ROOF DRAINAGE SYSTEM INSTALLATION

- A. General: Install sheet metal roof drainage items to produce complete roof drainage system according to SMACNA recommendations and as indicated. Coordinate installation of roof perimeter flashing with installation of roof drainage system.
- B. Hanging Gutters: Join sections with riveted and soldered joints or with lapped joints sealed with sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchored gutter brackets spaced not more than 36 inches (900 mm) apart. Provide end closures and seal watertight with sealant. Slope to downspouts.
 - 1. Fasten gutter spacers to front and back of gutter.
- C. Downspouts: Join sections with 1-1/2-inch (38-mm) telescoping joints.
 - 1. Provide hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at top and bottom and at approximately 60 inches (1500 mm) o.c. in between.
 - 2. Connect downspouts to underground drainage system with cast iron downspout shoes as indicated on drawings.
- D. Parapet Scuppers: Install scuppers where indicated through parapet. Continuously support scupper, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and under roofing membrane.
 - 1. Anchor scupper closure trim flange to exterior wall and seal with elastomeric sealant to scupper.
- E. Conductor Heads: Anchor securely to wall with elevation of conductor top edge 1 inch below scupper discharge.
- F. Expansion-Joint Covers: Install expansion joint covers at locations and configuration indicated. Lap joints a minimum of 4-inches in direction of water flow.

3.4 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
- B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in SMACNA's "Architectural Sheet Metal Manual" and as indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at staggered 3-inch centers.

3.5 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines as indicated and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.
- B. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

3.6 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder.
- C. Clean off excess sealants.
- D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of installation, remove unused materials and clean finished surfaces. Maintain in a clean condition during construction.
- E. 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.

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**FLORIDA A&M UNIVERSITY
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CONSTRUCTION DOCUMENTS
SEPTEMBER 13, 2024**

SECTION 07 92 00 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes joint sealants for the following applications, including those specified by reference to this Section:
1. Exterior joints in the following vertical surfaces and horizontal nontraffic surfaces:
 - a. Control and expansion joints in unit masonry.
 - b. Perimeter joints between materials listed above and frames of doors, windows and louvers.
 - c. Control and expansion joints in ceilings and other overhead surfaces.
 - d. Other joints as needed.
 2. Interior joints in the following vertical surfaces and horizontal nontraffic surfaces:
 - a. Control and expansion joints on exposed interior surfaces of exterior walls.
 - b. Perimeter joints of exterior openings where indicated.
 - c. Tile control and expansion joints. (mildew resistant)
 - d. Vertical joints on exposed surfaces of interior unit masonry or concrete walls and partitions.
 - e. Perimeter joints between interior wall surfaces and frames of interior doors or windows.
 - f. Joints between plumbing fixtures and adjoining walls, floors, and counters. (mildew resistant)
 - g. Other joints as needed.
 - h. Control and expansion joints in tile flooring.
 - i. Control and expansion joints in ceilings and other overhead surfaces.

1.2 PERFORMANCE REQUIREMENTS

- A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.
- B. Provide joint sealants for interior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.

1.3 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
- C. Product Certificates: For each type of joint sealant and accessory, signed by product manufacturer.
- D. SWRI Validation Certificate: For each elastomeric sealant specified to be validated by SWRI's Sealant Validation Program.
- E. Warranties: Special warranties specified in this Section.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

1.5 PROJECT CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
 - 2. When joint substrates are wet.
 - 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 - 4. Contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.6 WARRANTY

- 1. Standard Manufacturers 1 year warranty

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.

- B. Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 ELASTOMERIC JOINT SEALANTS

- A. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.
- B. Stain-Test-Response Characteristics: Where elastomeric sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.
- C. Suitability for Immersion in Liquids. Where elastomeric sealants are indicated for Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing according to ASTM C 1247 and qualify for the length of exposure indicated by reference to ASTM C 920 for Class 1 or 2. Liquid used for testing sealants is deionized water, unless otherwise indicated.
- D. Single-Component Neutral-Curing Silicone Sealant (Exterior and Interior)
 - 1. Products: (But not limited to)
 - a. Dow Corning Corporation; 790.
 - b. GE Silicones; SilPruf LM SCS2700.
 - c. Tremco; Spectrem 1 (Basic).
 - d. GE Silicones; SilPruf SCS2000.
 - e. Pecora Corporation; 864.
 - f. Pecora Corporation; 890.
 - g. Polymeric Systems Inc.; PSI-641.
 - h. Sonneborn, Division of ChemRex Inc.; Omniseal.
 - i. Tremco; Spectrem 3.

2.3 PREFORMED JOINT SEALANTS (Where needed)

- A. Preformed Silicone-Sealant System: Manufacturer's standard system consisting of precured low-modulus silicone extrusion, in sizes to fit joint widths indicated, combined with a neutral-curing silicone sealant for bonding extrusions to substrates.
 - 1. Products: (but not limited to)
 - a. Dow Corning Corporation; 123 Silicone Seal.
 - b. GE Silicones; UltraSpan US1100.
 - c. Pecora Corporation; Sil-Span.
 - d. Tremco; Spectrem Ez Seal.

2.4 PREFORMED TAPE SEALANTS (Where needed)

- A. Back-Bedding Mastic Tape Sealant: Preformed, butyl-based elastomeric tape sealant with a solids content of 100 percent; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape manufacturers for application indicated; packaged on rolls with a release paper backing; and complying with ASTM C 1281 and AAMA 800 for products indicated below:
 - 1. AAMA 804.3 tape, where indicated.
 - 2. AAMA 806.3 tape, for applications in which tape is subject to continuous pressure.
 - 3. AAMA 807.3 tape, for applications in which tape is not subject to continuous pressure.
- B. Expanded Cellular Tape Sealant: Closed-cell, PVC foam tape sealant; factory coated with adhesive on both surfaces; packaged on rolls with release liner protecting adhesive; and complying with AAMA 800 for the following types:
 - 1. Type 1, for applications in which tape acts as the primary sealant.
 - 2. Type 2, for applications in which tape is used in combination with a full bead of liquid sealant.

2.5 JOINT-SEALANT BACKING (Where needed)

- A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 26 deg F. Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and to otherwise contribute to optimum sealant performance.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.6 MISCELLANEOUS MATERIALS (As needed)

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
 - a. Concrete.
 - b. Masonry.
 - c. Unglazed surfaces of ceramic tile.
 - 3. Remove laitance and form-release agents from concrete.
 - 4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
 - a. Metal.

- b. Glass.
 - c. Glazed surfaces of ceramic tile.
- B. Joint Priming: Prime joint substrates, where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Acoustical Sealant Application Standard: Comply with recommendations in ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.
- D. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- E. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- F. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

- G. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
1. Remove excess sealant from surfaces adjacent to joints.
 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.
 4. Provide flush joint configuration where indicated per Figure 5B in ASTM C 1193.
 5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 5C in ASTM C 1193.
 - a. Use masking tape to protect surfaces adjacent to recessed tooled joints.
- H. Installation of Preformed Tapes: Install according to manufacturer's written instructions.
- I. Installation of Preformed Silicone-Sealant System: Comply with the following requirements:
1. Apply masking tape to each side of joint, outside of area to be covered by sealant system.
 2. Apply silicone sealant to each side of joint to produce a bead of size complying with preformed silicone-sealant system manufacturer's written instructions and covering a bonding area of not less than 3/8 inch (10 mm). Hold edge of sealant bead 1/4 inch (6 mm) inside masking tape.
 3. Within 10 minutes of sealant application, press silicone extrusion into sealant to wet extrusion and substrate. Use a roller to apply consistent pressure and ensure uniform contact between sealant and both extrusion and substrate.
 4. Complete installation of sealant system in horizontal joints before installing in vertical joints. Lap vertical joints over horizontal joints. At ends of joints, cut silicone extrusion with a razor knife.
- J. Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping, taking care not to pull or stretch material, producing seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures where expansion of sealant requires acceleration to produce seal, apply heat to sealant in compliance with sealant manufacturer's written instructions.

3.4 FIELD QUALITY CONTROL

1. Inspect joints for complete fill, for absence of voids, and for joint configuration complying with specified requirements. Record results in a field-adhesion-test log.
2. Inspect tested joints and report on the following:

- a. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate. Compare these results to determine if adhesion passes sealant manufacturer's field-adhesion hand-pull test criteria.
 - b. Whether sealants filled joint cavities and are free of voids.
 - c. Whether sealant dimensions and configurations comply with specified requirements.
3. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant fill, sealant configuration, and sealant dimensions.
 4. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.
- B. Evaluation of Field Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.5 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

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**FLORIDA A&M UNIVERSITY
RATTLER POINT WASH HOUSE BUILD-OUT
CONSTRUCTION DOCUMENTS
SEPTEMBER 13, 2024**

SECTION 08 11 13 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Standard hollow metal **doors and frames**.

1.2 DEFINITIONS

- A. Minimum Thickness: Minimum thickness of base metal without coatings.
- B. Standard Hollow Metal Work: Hollow metal work fabricated according to ANSI/SDI A250.8.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, **fire-resistance rating**, and finishes.
- B. Shop Drawings: Include the following:
1. Elevations of each door design.
 2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
 3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
 4. Locations of reinforcement and preparations for hardware.
 5. Details of each different wall opening condition.
 6. Details of anchorages, joints, field splices, and connections.
 7. Details of accessories.
 8. Details of moldings, removable stops, and glazing.
 9. Details of conduit and preparations for power, signal, and control systems.
- C. Other Action Submittals:
1. Schedule: Provide a schedule of hollow metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with door hardware schedule.
- D. Oversize Construction Certification: For assemblies required to be fire rated and exceeding limitations of labeled assemblies.

- A. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each type of hollow metal door and frame assembly.

1.2 QUALITY ASSURANCE

- A. Source Limitations: Obtain hollow metal work from single source from single manufacturer.
- B. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing according to **NFPA 252 or UL 10B**.
- C. Fire-Rated, Borrowed-Light Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled, by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to **NFPA 257 or UL 9**. Label each individual glazed lite.
- D. Smoke-Control Door Assemblies: Comply with **NFPA 105 or UL 1784**.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.
 - 1. Provide additional protection to prevent damage to finish of factory-finished units.
- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum **4-inch- (102-mm-)** high wood blocking. Do not store in a manner that traps excess humidity.
 - 1. Provide minimum **1/4-inch (6-mm)** space between each stacked door to permit air circulation.

1.4 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.5 COORDINATION

- A.
- B. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor

bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements **(but not limited to)**

1. Amweld Building Products, LLC.
2. Benchmark; a division of Therma-Tru Corporation.
3. Ceco Door Products; an Assa Abloy Group company.
4. Curries Company; an Assa Abloy Group company.
5. Deansteel Manufacturing Company, Inc.
6. Firedoor Corporation.
7. Fleming Door Products Ltd.; an Assa Abloy Group company.
8. Habersham Metal Products Company.
9. Karpen Steel Custom Doors & Frames.
10. Kewanee Corporation (The).
11. Mesker Door Inc.
12. Pioneer Industries, Inc.
13. Security Metal Products Corp.
14. Steelcraft; an Ingersoll-Rand company.
15. Windsor Republic Doors.

2.2 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum **A60 (ZF180)** metallic coating.
- D. Frame Anchors: ASTM A 591/A 591M, Commercial Steel (CS), **40Z (12G)** coating designation; mill phosphatized.
1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
- E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
- F. Powder-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow metal frames of type indicated.

- G. Grout: ASTM C 476, except with a maximum slump of **4 inches**, as measured according to ASTM C 143/C 143M.
- H. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool with **6- to 12-lb/cu. ft.** density; with maximum flame-spread and smoke-development indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.
- I. Glazing: Comply with requirements in Division 08 Section "Glazing."
- J. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for **15-mil (0.4-mm)** dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.3 STANDARD HOLLOW METAL DOORS

- A. General: Provide doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8.
 - 1. Design: **As indicated on drawings.**
 - 2. Core Construction: Manufacturer's standard kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate, mineral-board, or vertical steel-stiffener core.
 - a. Fire Door Core: As required to provide fire-protection **and temperature-rise** ratings indicated.
 - b. Thermal-Rated (Insulated) Doors: Provide doors fabricated with thermal-resistance value (R-value) of not less than R-15 when tested according to ASTM C 1363.
 - 1) Locations: **Where indicated on drawings.**
 - 3. Vertical Edges for Single-Acting Doors: **Manufacturer's standard.**
 - a. Beveled Edge: **1/8 inch in 2 inches (3 mm in 50 mm).**
 - 4. Vertical Edges for Double-Acting Doors: Round vertical edges with **2-1/8-inch (54-mm)** radius.
 - 5. Top and Bottom Edges: Closed with flush or inverted **0.042-inch- (1.0-mm-)** thick, end closures or channels of same material as face sheets.
 - 6. Tolerances: Comply with SDI 117, "Manufacturing Tolerances for Standard Steel Doors and Frames."
- B. Exterior Doors: Face sheets fabricated from metallic-coated steel sheet. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:
 - a. Width: **1-3/4 inches (44.5 mm).**
 - b. 16 ga.

- C. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.
- D. Fabricate concealed stiffeners and hardware reinforcement from either cold- or hot-rolled steel sheet.

2.4 STANDARD HOLLOW METAL FRAMES (Doors and Windows)

- A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.
- B. Exterior Frames: Fabricated from metallic-coated steel sheet.
 - 1. Fabricate frames with mitered or coped corners.
 - 2. Minimum 14 ga. thick steel sheet.
- C. Interior Frames Doors and Windows: Fabricated from cold-rolled steel sheet.
 - 1. Fabricate frames with mitered or coped corners.
 - 2. Frames for Borrowed Lights: Same as adjacent door frame.
 - 3. Minimum 18 ga. thick steel sheet.
- D. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcement plates from same material as frames.
 - 1. Prep for door closer (all locations)

2.5 FRAME ANCHORS

- A. Jamb Anchors:
 - 1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch 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.
- B. Floor Anchors: Formed from same material as frames, not less than 0.042 inch thick, and as follows:
 - 1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
 - 2. Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch height adjustment. Terminate bottom of frames at finish floor surface.

2.6 STOPS AND MOLDINGS

- A. Moldings for Glazed Lites in Doors: Minimum 0.032 inch thick, fabricated from same material as door face sheet in which they are installed.

- B. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of **5/8 inch** high unless otherwise indicated.
- C. Loose Stops for Glazed Lites in Frames: Minimum **0.032 inch** thick, fabricated from same material as frames in which they are installed.
- D. Terminated Stops: Where indicated on interior door frames, terminate stops **6 inches** above finish floor with a **45 or 90-degree** angle cut, and close open end of stop with steel sheet closure. Cover opening in extension of frame with welded-steel filler plate, with welds ground smooth and flush with frame.
 - 1. Provide terminated stops **unless otherwise indicated**.

2.7 ACCESSORIES (as needed)

- A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.
- B. Ceiling Struts: Minimum **1/4-inch-thick by 1-inch-** wide steel.
- C. Grout Guards: Formed from same material as frames, not less than **0.016** thick.

2.8 FABRICATION

- A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
- B. Tolerances: Fabricate hollow metal work to tolerances indicated in **SDI 117, ANSI/NAAMM-HMMA 861**.
- C. Hollow Metal Doors:
 - 1. Exterior Doors: Provide weep-hole openings in bottom of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.
 - 2. Glazed Lites: Factory cut openings in doors.
 - 3. Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum **3/4** beyond edge of door on which astragal is mounted.
- D. HOLLOW METAL FRAMES
 - 1. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.
 - 2. Weatherstripped Frames: Subject to the same compliance standards and requirements as standard hollow metal frames, provide where indicated weatherstripped profiles with 1/8" integral kerf formed into the frame soffit able to receive manufacturer's listed gasket material. Available for use in both masonry and drywall construction, with fire rating up to 3 hours complying with NFPA 105, UL 1784, and ASTM E-283 Test criteria.

3. Exterior Frames: Fabricated of hot-dipped zinc coated steel that complies with ASTM A 653/A 653M, Coating Designation A60.
 - a. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.
 - b. Frames: Minimum 14 gauge (0.067-inch -1.7-mm) thick steel sheet.
 - c. Manufacturers Basis of Design:
 - 1) CECO Door Products – SU Series.
 - 2) Curries Company – M Series.
4. Interior Frames: Fabricated from cold-rolled steel sheet that complies with ASTM A 1008/A 1008M.
 - a. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.
 - b. Frames: Minimum 16 gauge (0.053-inch -1.3-mm) thick steel sheet.
 - c. Manufacturers Basis of Design:
 - 1) CECO Door Products BQ/BU/DQ/DU/BR/DR Series.
 - 2) CECO Door Products SQ/SU/SR Series.
 - 3) CECO Door Products – Kerfed Weatherstripped DQW/DRW Series.
 - 4) Curries Company C/CM/CG Series.
 - 5) Curries Company M/G Series.
 - 6) Curries Company – Kerfed Weatherstripped WC/WM Series.
5. Fire rated frames: Fabricate frames in accordance with NFPA 80, listed and labeled by a qualified testing agency, for fire-protection ratings indicated.
6. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 Table 4 with reinforcement plates from same material as frames.

Commented [JG1]: Node selectable series. Should not have all these listed together. Typical for all series

- E. Fabricate concealed stiffeners, edge channels, and hardware reinforcement from either cold- or hot-rolled steel sheet.
- F. Hardware Preparation: Factory prepare hollow metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."
 1. Locate hardware as indicated, or if not indicated, according to **ANSI/SDI A250.8, ANSI/NAAMM-HMMA 861.**
 2. Reinforce doors and frames to receive nontemplated, mortised and surface-mounted door hardware.
- G. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints.
 1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow metal work.
 2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
 3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.

2.9 STEEL FINISHES

- A. Prime Finish: Apply manufacturer's standard primer immediately after cleaning and pretreating.

1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

2.10 SPECIAL FUNCTION HOLLOW METAL DOORS

- A. Security Door Assemblies: Subject to the same compliance standards and requirements as standard hollow metal doors, provide manufacturer's security door system tested in accordance with ANSI/NAAMM/HMMA 862-87 or 863-98 commercial and detention hollow metal standards. Fabricate with minimum 14 gauge construction, 1 $\frac{3}{4}$ " thickness, reinforced with 18 gauge steel stiffeners welded to the face sheets every 4" on center with spot welds 4" on center the full height of the door and minimum 10 gauge inverted steel end channels welded to both face sheets. Furnish as a complete unit with factory welded frame.
 1. Manufacturers Basis of Design:
 - a. Curries Company 847 Series Frames
 - b. CECO Door Products RestrictDor Series Frames

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.
- C. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 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.
- B. Prior to installation, adjust and securely brace welded hollow metal frames for squareness, alignment, twist, and plumbness to the following tolerances:
 1. Squareness: Plus or minus $\frac{1}{16}$ inch , measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 2. Alignment: Plus or minus $\frac{1}{16}$ 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 on a perpendicular line from head to floor.
- C. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

- A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.
- B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with **ANSI/SDI A250.11, HMMA 840**.
1. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
 - a. At fire-protection-rated openings, install frames according to NFPA 80.
 - b. 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.
 - c. Install frames with removable glazing stops located on secure side of opening.
 - d. Install door silencers in frames before grouting.
 - e. Remove temporary braces necessary for installation only after frames have been properly set and secured.
 - f. Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
 - g. Field apply bituminous coating to backs of frames that are filled with grout containing antifreezing agents.
 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.
 - a. Floor anchors may be set with powder-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
 3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.
 4. Concrete Walls: Solidly fill space between frames and concrete with grout. Take precautions, including bracing frames, to ensure that frames are not deformed or damaged by grout forces.
 5. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
 6. In-Place Gypsum Board Partitions: Secure frames in place with postinstalled expansion anchors through floor anchors at each jamb. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.

7. Ceiling Installation Tolerances: Adjust hollow metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
 - a. Squareness: Plus or minus **1/16 inch**, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus **1/16 inch**, measured at jambs on a horizontal line parallel to plane of wall.
 - c. Twist: Plus or minus **1/16 inch**, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - d. Plumbness: Plus or minus **1/16 inch**, measured at jambs at floor.
- C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.
 1. Non-Fire-Rated Standard Steel Doors:
 - a. Jambs and Head: **1/8 inch** plus or minus **1/16 inch**.
 - b. Between Edges of Pairs of Doors: **1/8 inch** plus or minus **1/16 inch**.
 - c. Between Bottom of Door and Top of Threshold: Maximum **3/8 inch**.
 - d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum **3/4 inch**.
 2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
 3. Smoke-Control Doors: Install doors according to **NFPA 105, UBC Standard 7-2**.
- D. Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow metal manufacturer's written instructions.
 1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than **9 inches** o.c. and not more than **2 inches** o.c. from each corner.

3.4 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from hollow metal work immediately after installation.
- C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- D. Metallic-Coated Surfaces: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

END OF SECTION 08 11 13

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SECTION 08 14 16 - FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Solid-core doors with wood-veneer faces.
2. Shop priming flush wood doors or Factory fitting flush wood doors to frames and factory machining for hardware.

1.2 SUBMITTALS

A. Product Data: For each type of door indicated. Include details of core and edge construction and trim for openings. Include factory-finishing specifications.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; location and extent of hardware blocking; and other pertinent data.

1. Indicate dimensions and locations of mortises and holes for hardware.
2. Indicate dimensions and locations of cutouts.
3. Indicate requirements for veneer matching.
4. Indicate doors to be factory finished and finish requirements.
5. Indicate fire-protection ratings for fire-rated doors.

C. Samples for Verification:

1. Factory finishes applied to actual door face. Materials, approximately, 8 by 10 inch, for each material and finish. Provide manufacturers full range of stain colors.
2. Frames for light openings, 6 inches long, for each material, type, and finish required.

D. Warranty: Sample of special warranty.

1.3 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that is certified for chain of custody by an FSC-accredited certification body.

- B. Source Limitations: Obtain flush wood doors from single manufacturer.
- C. Quality Standard: In addition to requirements specified, comply with AWI's "Architectural Woodwork Quality Standards Illustrated."
 - 1. Provide AWI Quality Certification Labels or an AWI letter of licensing for Project indicating that doors comply with requirements of grades specified.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of referenced standard and manufacturer's written instructions.
- B. Package doors individually in plastic bags or cardboard cartons.
- C. Mark each door on top and bottom rail with opening number used on Shop Drawings.

1.5 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
- B. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining temperature between 60 and 90 deg F (16 and 32 deg C) and relative humidity between 43 and 70 percent during the remainder of the construction period.

1.6 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Warping (bow, cup, or twist) more than 1/4 inch (6.4 mm) in a 42-by-84-inch (1067-by-2134-mm) section.
 - b. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch (0.25 mm in a 76.2-mm) span.
 - 2. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
 - 3. Warranty Period for Solid-Core Exterior Doors: Five years from date of Substantial Completion.
 - 4. Warranty Period for Solid-Core Interior Doors: Life of installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, (but not limited to)
 - 1. Graham; an Assa Abloy Group company.
 - 2. Haley Brothers, Inc.
 - 3. Marshfield – Algoma (by Masonite Architectural)
 - 4. Mohawk Flush Doors, Inc.; a Masonite company.
 - 5. Oshkosh Architectural Door Company.
 - 6. Trudoor, LLC.

2.2 DOOR CONSTRUCTION, GENERAL

- A. Provide doors made with adhesives and composite wood products that do not contain urea formaldehyde.
- B. WDMA I.S.1-A Performance Grade:
 - 1. Heavy Duty unless otherwise indicated.
 - 2. Extra Heavy Duty: public toilets and janitor's closets.
- C. Structural-Composite-Lumber-Core Doors:
 - 1. Structural Composite Lumber: WDMA I.S.10
 - a. Screw Withdrawal, Edge: 400 lbf (1780 N).
- D. Fire-Protection-Rated Doors: Provide core specified or mineral core as needed to provide fire-protection rating indicated.
 - 1. Edge Construction: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed edges.
 - 2. Pairs: Provide formed-steel edges and astragals with intumescent seals.
 - a. Finish steel edges and astragals to match door hardware (locksets or exit devices).

2.3 VENEERED-FACED DOORS FOR TRANSPARENT FINISH

- A. Interior Solid-Core Doors
 - 1. Grade: Custom (Grade A faces)
 - 2. Species: Select red oak
 - 3. Cut: Plain sliced

4. Match between Veneer Leaves: Pleasing match.
 5. Assembly of Veneer Leaves on Door Faces: Balance match.
 6. Core: Structural composite lumber Construction: seven plies. Stiles and rails are bonded to core, then entire unit abrasive planed before veneering. Faces are bonded to core using a hot press.
 7. WDMA I.S.1-A Performance Grade: Heavy Duty.
- B. Wood Beads for Light Openings in Wood Doors: Provide manufacturer's standard wood beads as follows unless otherwise indicated.
1. Wood Species: Same species as door faces.
 2. Profile: Flush rectangular beads.
 3. At wood-core doors with 20-minute fire-protection ratings, provide wood beads and metal glazing clips approved for such use.
- C. Wood-Veneered Beads for Light Openings in Fire-Rated Doors: Manufacturer's standard wood-veneered noncombustible beads matching veneer species of door faces and approved for use in doors of fire-protection rating indicated. Include concealed metal glazing clips where required for opening size and fire-protection rating indicated.
- D. Metal Frames for Light Openings in Fire-Rated Doors: Manufacturer's standard frame formed of 0.048-inch- thick, cold-rolled steel sheet; with baked-enamel or powder coat; and approved for use in doors of fire-protection rating indicated.

2.4 FABRICATION

- A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
1. Comply with requirements in NFPA 80 for fire-rated doors.
- B. Transom and Side Panels: Fabricate matching panels with same construction, exposed surfaces, and finish as specified for associated doors. Finish bottom edges of transoms and top edges of rabbeted doors same as door stiles.
1. Fabricate door and transom panels with full-width, solid-lumber, rabbeted, meeting rails. Provide factory-installed spring bolts for concealed attachment into jambs of metal door frames.
- C. Openings: Cut and trim openings through doors in factory.
1. Light Openings: Trim openings with moldings of material and profile indicated.
 2. Louvers: Factory install louvers in prepared openings.

2.5 PRIMING

- A. Doors for Transparent Finish: Shop prime doors with stain (if required), other required pretreatments, and first coat of finish as specified in Division 09 Section Interior Painting Seal all four edges, edges of cutouts, and mortises with first coat of finish.

2.6 FACTORY FINISHING

- A. Factory Finish Doors.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine doors and installed door frames before hanging doors.
 - 1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
 - 2. Reject doors with defects.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Hardware: For installation, see Division 08 Section "Door Hardware."
- B. Installation Instructions: Install doors to comply with manufacturer's written instructions and the referenced quality standard, and as indicated.
- C. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors. Machine doors for hardware. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.
 - 1. Clearances: Provide 1/8 inch at heads, jambs, and between pairs of doors. Provide 1/8 inch from bottom of door to top of decorative floor finish or covering unless otherwise indicated. Where threshold is shown or scheduled, provide 1/4 inch from bottom of door to top of threshold unless otherwise indicated.
 - a. Comply with NFPA 80 for fire-rated doors.
 - 2. Bevel non-fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock and hinge edges.

3. Bevel fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock edge; trim stiles and rails only to extent permitted by labeling agency.
- D. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
- E. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

3.3 ADJUSTING

- A. Operation: Rehang or replace doors that do not swing or operate freely.
- B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 08 14 16

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SECTION 08 43 13 - ALUMINUM-FRAMED STOREFRONTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Storefront framing.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For aluminum-framed storefronts. Include plans, elevations, sections, full-size details, and attachments to other work.

1. Include details of provisions for assembly expansion and contraction and for draining moisture occurring within the assembly to the exterior.
2. Include full-size isometric details of each type of vertical-to-horizontal intersection of aluminum-framed storefronts, showing the following:
 - a. Joinery, including concealed welds.
 - b. Anchorage.
 - c. Expansion provisions.
 - d. Glazing.
 - e. Flashing and drainage.

3. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.

C. Samples for Initial Selection: For units with factory-applied color finishes.

D. Delegated-Design Submittal: For aluminum-framed storefronts indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Energy Performance Certificates: For aluminum-framed storefronts, accessories, and components, from manufacturer.
 - 1. Basis for Certification: NFRC-certified energy performance values for each aluminum-framed storefront.
- C. Product Test Reports: For aluminum-framed storefronts, for tests performed by manufacturer and witnessed by a qualified testing agency.
- D. Sample Warranties: For special warranties.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For aluminum-framed storefronts to include in maintenance manuals.
- B. Maintenance Data for Structural Sealant: For structural-sealant-glazed storefront to include in maintenance manuals. Include ASTM C 1401 recommendations for post-installation-phase quality-control program.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. Structural-Sealant Glazing: Comply with ASTM C 1401 for design and installation of storefront systems.

1.6 WARRANTY

- A. Special Warranty: Manufacturer and Installer agrees to repair or replace components of aluminum-framed storefronts that do not comply with requirements or that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures, including, but not limited to, excessive deflection.
 - b. Noise or vibration created by wind and thermal and structural movements.
 - c. Deterioration of metals and other materials beyond normal weathering.
 - d. Water penetration through fixed glazing and framing areas.
 - e. Failure of operating components.
 - 2. Warranty Period: 10 years from date of Substantial Completion.

- B. Special Finish Warranty: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. 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. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide or comparable product by one of the following: (Kawneer North America Trifab 451T 2" x 4").
 - 1. EFCO Corporation.
 - 2. Kawneer North America, as Alcoa company.
 - 3. TRACO.
 - 4. Vistawall Architectural Products; The Vistawall Group; a Bluescope Steel company.
 - 5. YKK AP America Inc.
- B. Source Limitations: Obtain all components of aluminum-framed storefront system and windows, including framing and accessories, from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified Florida Registered Professional Engineer to design aluminum-framed storefronts.
- B. General Performance: Comply with performance requirements specified, as determined by testing of aluminum-framed storefronts representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.
 - 1. Aluminum-framed storefronts and windows shall withstand movements of supporting structure, including, but not limited to, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
 - 2. Failure also includes the following:

- a. Thermal stresses transferring to building structure.
 - b. Glass breakage.
 - c. Noise or vibration created by wind and thermal and structural movements.
 - d. Loosening or weakening of fasteners, attachments, and other components.
 - e. Failure of operating units.
- C. Structural Loads:
- 1. Wind Loads: 130 mph per F.B.C.
- D. Energy Performance: Certify and label energy performance according to NFRC as follows:
- 1. Thermal Transmittance (U-factor): Fixed glazing and framing areas as a system shall have U-factor of not more than 0.57 Btu/sq. ft. x h x deg F (3.23 W/sq. m x K) as determined according to NFRC 100.
 - 2. Solar Heat Gain Coefficient (SHGC): Fixed glazing and framing areas as a system shall have a SHGC of no greater than 0.45 as determined according to NFRC 200.
 - 3. Condensation Resistance: Fixed glazing and framing areas as a system shall have an NFRC-certified condensation resistance rating of no less than 45 as determined according to NFRC 500.
- E. Noise Reduction: Test according to ASTM E 90, with ratings determined by ASTM E 1332, as follows.
- 1. Outdoor-Indoor Transmission Class: Minimum 26 30 34 <Insert number>.
- F. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes.
- 1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
 - 2. Thermal Cycling: No buckling; stress on glass; sealant failure; excess stress on framing, anchors, and fasteners; or reduction of performance when tested according to AAMA 501.5.
 - a. Interior Ambient-Air Temperature: 75 deg F (24 deg C).
- G. Structural-Sealant Joints:
- 1. Designed to carry gravity loads of glazing.
- H. Structural Sealant: ASTM C 1184. Capable of withstanding tensile and shear stresses imposed by structural-sealant-glazed, aluminum-framed storefronts without failing adhesively or cohesively. When tested for preconstruction adhesion and compatibility, cohesive failure of sealant shall occur before adhesive failure.
- 1. Adhesive failure occurs when sealant pulls away from substrate cleanly, leaving no sealant material behind.

2. Cohesive failure occurs when sealant breaks or tears within itself but does not separate from each substrate, because sealant-to-substrate bond strength exceeds sealant's internal strength.

2.3 STOREFRONT AND WINDOW SYSTEMS

- A. Framing Members: Manufacturer's extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.
 1. Exterior Framing Construction: Thermally improved.
 2. Glazing System: Retained mechanically with gaskets on four sides.
 3. Glazing Plane: Front.
 4. Finish: High-performance organic finish.
 5. Fabrication Method: Either factory or Field-fabricated stick system.
 6. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
 7. Steel Reinforcement: As required by manufacturer.
- B. Backer Plates: Manufacturer's standard, continuous backer plates for framing members, if not integral, where framing abuts adjacent construction.
- C. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

2.4 GLAZING

- A. Glazing: Comply with Division 8 Section "Glazing."
- B. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers.
- C. Glazing Sealants: As recommended by manufacturer.
- D. Structural Glazing Sealants: ASTM C 1184 chemically curing silicone formulation that is 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 storefront system indicated.
 1. Color: As selected by Architect from manufacturer's full range of colors.
- E. Weatherseal Sealants: ASTM C 920 for Type S; Grade NS; Class 25; Uses NT, G, A, and O; chemically curing silicone formulation that is compatible with structural sealant and other system components with which it comes in contact; recommended by structural-sealant, weatherseal-sealant, and structural-sealant-glazed storefront manufacturers for this use.

1. Color: Match structural sealant.

2.5 MATERIALS

- A. Sheet and Plate: ASTM B 209 (ASTM B 209M).
- B. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221 (ASTM B 221M).
- C. Extruded Structural Pipe and Tubes: ASTM B 429/B 429M.
- D. Structural Profiles: ASTM B 308/B 308M.
- E. Steel Reinforcement:
 1. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
 2. Cold-Rolled Sheet and Strip: ASTM A 1008/A 1008M.
 3. Hot-Rolled Sheet and Strip: ASTM A 1011/A 1011M.
 4. Primer: Manufacturer's standard zinc-rich, corrosion-resistant primer complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM, and prepare surfaces according to applicable SSPC standard.

2.6 ACCESSORIES

- A. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
 1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
 2. Reinforce members as required to receive fastener threads.
 3. Use exposed fasteners with countersunk Phillips screw heads, finished to match framing system.
- B. Anchors: Three-way adjustable anchors with minimum adjustment of 1 inch (25.4 mm) that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.
 1. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A 123/A 123M or ASTM A 153/A 153M requirements.
- C. Concealed Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials.
- D. Bituminous Paint: Cold-applied asphalt-mastic paint containing no asbestos, formulated for 30-mil (0.762-mm) thickness per coat.

2.7 FABRICATION

- A. Form or extrude aluminum shapes before finishing.
- B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- C. Fabricate components that, when assembled, have the following characteristics:
 - 1. Profiles that are sharp, straight, and free of defects or deformations.
 - 2. Accurately fitted joints with ends coped or mitered.
 - 3. Physical and thermal isolation of glazing from framing members.
 - 4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
 - 5. Provisions for field replacement of glazing from interior.
 - 6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- D. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.
- E. Structural-Sealant-Glazed Framing Members: Include accommodations for using temporary support device to retain glazing in place while structural sealant cures.
- F. Storefront Framing: Fabricate components for assembly using screw-spline system.
- G. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.8 ALUMINUM FINISHES

- A. High-Performance Organic Finish: Two-coat fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - 1. Color and Gloss: As selected by Architect from manufacturer's full range.

2.9 SOURCE QUALITY CONTROL

- A. Structural Sealant: Perform quality-control procedures complying with ASTM C 1401 recommendations, including, but not limited to, assembly material qualification procedures, sealant testing, and assembly fabrication reviews and checks.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare surfaces that are in contact with structural sealant according to sealant manufacturer's written instructions, to ensure compatibility and adhesion. Preparation includes, but is not limited to, cleaning and priming surfaces.

3.3 INSTALLATION

- A. General:
 - 1. Comply with manufacturer's written instructions.
 - 2. Do not install damaged components.
 - 3. Fit joints to produce hairline joints free of burrs and distortion.
 - 4. Rigidly secure nonmovement joints.
 - 5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
 - 6. Seal perimeter and other joints watertight unless otherwise indicated.

 - 7. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with materials recommended by manufacturer for this purpose or by installing nonconductive spacers.
 - 8. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
- B. Set continuous sill members and flashing in full sealant bed, as specified in Division 7 Section "Joint Sealants," to produce weathertight installation.
- C. Install components plumb and true in alignment with established lines and grades.
- D. Install operable units level and plumb, securely anchored, and without distortion. Adjust weather-stripping contact and hardware movement to produce proper operation.
- E. Install glazing as specified in Division 8 Section "Glazing."

- F. Install weatherseal sealant according to Division 7 Section "Joint Sealants" and according to sealant manufacturer's written instructions to produce weatherproof joints. Install joint filler behind sealant as recommended by sealant manufacturer.

3.4 ERECTION TOLERANCES

- A. Erection Tolerances: Install aluminum-framed storefronts to comply with the following maximum tolerances:
 - 1. Plumb: 1/4 inch in 40 feet (6.35 mm in 12.2 m).
 - 2. Level: 1/8 inch in 20 feet (3.2 mm in 6 m).
 - 3. Alignment:
 - a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch (12.7 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 (12.7 to 25.4 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 (25.4 mm) wide or more, limit offset from true alignment to 1/4 inch (6 mm).
 - 4. Location: Limit variation from plane to 1/8 inch in 12 feet (3.2 mm in 3.6 m).

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Field Quality-Control Testing: Perform the following test on representative areas of aluminum-framed storefronts.
 - 1. Water-Spray Test: Before installation of interior finishes has begun, areas designated by Architect shall be tested according to AAMA 501.2 and shall not evidence water penetration.
 - a. Perform a minimum of two tests in areas as directed by Architect.
 - 2. Air Infiltration: ASTM E 783 at 1.5 times the rate specified for laboratory testing in "Performance Requirements" Article but not more than 0.09 cfm/sq. ft. (0.45 L/s per sq. m) at a static-air-pressure differential of 1.57 lbf/sq. ft. (75 Pa).
 - a. Perform a minimum of two tests in areas as directed by Architect.
 - b. Perform tests in each test area as directed by Architect. Perform at least three tests, prior to 70 percent completion.

3. Water Penetration: ASTM E 1105 at a minimum uniform and cyclic static-air-pressure differential of 0.67 times the static-air-pressure differential specified for laboratory testing in "Performance Requirements" Article, but not less than 6.24 lbf/sq. ft. (300 Pa), and shall not evidence water penetration.
- C. Structural-Sealant Adhesion: Test structural sealant according to recommendations in ASTM C 1401, Destructive Test Method A, "Hand Pull Tab (Destructive)," Appendix X2.
 1. Test a minimum of two areas on each building facade.
 2. Repair installation areas damaged by testing.
 - D. Aluminum-framed storefronts will be considered defective if they do not pass tests and inspections.
 - E. Prepare test and inspection reports.

END OF SECTION 08 43 13

**FLORIDA A&M UNIVERSITY
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CONSTRUCTION DOCUMENTS
SEPTEMBER 13, 2024**

SECTION 08 80 00 - GLAZING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes:
 - 1. Glass for windows.
 - 2. Glazing sealants and accessories.

1.3 COORDINATION

- A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Glass Samples: For each type of glass product other than clear monolithic vision glass the following products; 12 inches (300 mm) square.
 - 1. Tinted glass.
 - 2. Insulating glass.
- C. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

1.5 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. Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.
- C. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
- B. Comply with insulating-glass manufacturer's written instructions for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

1.7 FIELD CONDITIONS

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
 - 1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or are below 40 deg F (4.4 deg C).

1.8 WARRANTY

- A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.
 - 1. Warranty Period: 10 years from date of Substantial Completion.
- B. Manufacturer's Special Warranty for Laminated Glass: Manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed

to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.

1. Warranty Period: 10 years from date of Substantial Completion.

C. Manufacturer's Special Warranty for Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, but limited to:

1. AGC Glass North America
2. AFG Industries
3. Guardian Industries Corp.
4. Pilkington North America
5. PPG Industries, Inc.

B. Source Limitations for Glass: Obtain from single source from single manufacturer for each glass type.

C. Source Limitations for Glazing Accessories: Obtain from single source from single manufacturer for each product and installation method.

2.2 PERFORMANCE REQUIREMENTS

A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

B. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined according to the IBC and ASTM E 1300.

1. Design Wind Pressures: 130 MPH.

2.3 GLASS PRODUCTS, GENERAL

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.
 1. GANA Publications: "Laminated Glazing Reference Manual" and "Glazing Manual."
- B. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.
- C. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than the thickness indicated.

2.4 GLASS PRODUCTS

- A. Ultraclear Float Glass: ASTM C 1036, Type I, Class I (clear), Quality-Q3; and with visible light transmission of not less than 91 percent and solar heat gain coefficient of not less than 0.87.

2.5 INSULATING GLASS

- A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190.
 1. Sealing System: Dual seal, with manufacturer's standard primary and secondary sealants.
 2. Perimeter Spacer: Manufacturer's standard spacer material and construction
 3. Desiccant: Molecular sieve or silica gel, or a blend of both.

2.6 GLAZING SEALANTS (As Needed)

- A. General:
 1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
 2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.

3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.
- B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the work include but are not limited to the following:
 - a. Dow Corning Corporation; 790
 - b. GE Advanced Materials – Silicones; SilPruf LM SCS2700
 - c. May National Associates, Inc., Bondaflex Sil 290
 - d. Pecora Corporation: 890
 - e. Sika Corporation, Construction Products Division; SikaSil.

2.7 GLAZING TAPES (As Needed)

- A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:
1. AAMA 804.3 tape, where indicated.
 2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
 3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.

2.8 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, with requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- D. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

2.9 FABRICATION OF GLAZING UNITS

- A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.
- B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.
- C. Grind smooth and polish exposed glass edges and corners.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:
 - 1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
 - 2. Presence and functioning of weep systems.
 - 3. Minimum required face and edge clearances.
 - 4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.
- B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that leave visible marks in the completed Work.

3.3 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes

glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.

- C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
- D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- F. Provide spacers for glass lites where length plus width is larger than 50 inches (1270 mm).
 - 1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
 - 2. Provide 1/8-inch (3-mm) minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.
- H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- I. Set glass lites with proper orientation so that coatings face exterior or interior as specified.
- J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
- K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.
- L. Adjust glazing channel dimensions as required by Project Conditions during installation to provide necessary bite on glass, minimum edge and face clearances and adequate sealant thickness with reasonable tolerances.

3.4 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until right before each glazing unit is installed.
- F. Apply heel bead of elastomeric sealant.
- G. Center glass lites in openings on setting blocks, and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- H. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.5 GASKET GLAZING (DRY)

- A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- E. Install gaskets so they protrude past face of glazing stops.

3.6 SEALANT GLAZING (WET)

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.7 LOCK-STRIP GASKET GLAZING

- A. Comply with ASTM C 716 and gasket manufacturer's written instructions. Provide supplementary wet seal and weep system unless otherwise indicated.

3.8 CLEANING AND PROTECTION

- A. Immediately after installation remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.
 - 1. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.
- C. Remove and replace glass that is damaged during construction period.
- D. Wash glass on both exposed surfaces not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

3.9 GLASS SCHEDULE

- A. Glass Type GL-1: Low-E-coated, clear insulating glass (Windows/Doors)
 - 1. Basis-of-Design Product: AGC Energy Select 28
 - 2. Overall Unit Thickness: 1 inch.
 - 3. Minimum Thickness of Each Glass Lite: 1/4".
 - 4. Outdoor Lite: Annealed float glass.

5. Interspace Content: Air/Argon.
6. Indoor Lite: Annealed float glass.
7. Low-E Coating: Sputtered on second surface.
8. Winter Nighttime U-Factor: 0.28/0.24.
9. Summer Daytime U-Factor: 0.26/0.21
10. Visible Light Transmittance: 62 percent minimum.
11. Solar Heat Gain Coefficient: 0.28 maximum.
12. Safety glazing required.
13. Between glass muntins where indicated on drawings.

END OF SECTION 08 80 00

**FLORIDA A&M UNIVERSITY
RATTLER POINT WASH HOUSE BUILD-OUT
CONSTRUCTION DOCUMENTS
SEPTEMBER 13, 2024**

SECTION 09 11 10 - NON-LOAD-BEARING STEEL FRAMING (INTERIORS)

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes non-load-bearing steel framing members for the following applications:
1. Interior framing systems (e.g., supports for partition walls, framed soffits, furring, etc.).
 2. Interior suspension systems (e.g., supports for ceilings, suspended soffits, etc.).

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.

1.3 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

PART 2 - PRODUCTS

2.1 NON-LOAD-BEARING STEEL FRAMING, GENERAL

- A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.
1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal, unless otherwise indicated.
 2. Protective Coating: **corrosion resistance zinc coating**, unless otherwise indicated.

2.2 SUSPENSION SYSTEM COMPONENTS

- A. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, **0.0625-inch- (1.59-mm-)** diameter wire, or double strand of **0.0475-inch- (1.21-mm-)** diameter wire.
- B. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, **0.162-inch (4.12-mm)** diameter.

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 - 2. Interior suspension systems (e.g., supports for ceilings, suspended soffits, etc.).

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.

1.3 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.
- B. 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.

PART 2 - PRODUCTS

2.1 NON-LOAD-BEARING STEEL FRAMING, GENERAL

- A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.
 - 1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal, unless otherwise indicated.
 - 2. Protective Coating: **corrosion resistance zinc coating**, unless otherwise indicated.

2.2 SUSPENSION SYSTEM COMPONENTS

- A. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, **0.0625-inch- (1.59-mm-)** diameter wire, or double strand of **0.0475-inch- (1.21-mm-)** diameter wire.
- B. Hanger Attachments to Concrete:
 - 1. Anchors: Fabricated from corrosion-resistant materials with holes or loops for attaching wire hangers and capable of sustaining, without failure, a load equal to **5** times that imposed

by construction as determined by testing according to ASTM E 488 by an independent testing agency.

- a. Type: **Cast-in-place anchor, designed for attachment to concrete forms Postinstalled, expansion anchor.**
2. Powder-Actuated Fasteners: Suitable for application indicated, fabricated from corrosion-resistant materials with clips or other devices for attaching hangers of type indicated, and capable of sustaining, without failure, a load equal to **10** times that imposed by construction as determined by testing according to ASTM E 1190 by an independent testing agency.
- C. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, **0.162-inch (4.12-mm)** diameter.
- D. Carrying Channels: Cold-rolled, commercial-steel sheet with a base-metal thickness of **0.0538 inch (1.37 mm)** and minimum **1/2-inch- (12.7-mm-)** wide flanges.
 1. Depth: **2 inches (51 mm) mim.**
- E. Furring Channels (Furring Members):
 1. Cold-Rolled Channels: 25 gauge with 20 gauge for high impact drywall bare-steel thickness, with minimum **1/2-inch- (12.7-mm-)** wide flanges, **3/4 inch (19.1 mm)** deep.
 2. Steel Studs: ASTM C 645.
 - a. Minimum Base-Metal Thickness: **25 gauge with 20 gauge for high impact drywall.**
 - b. Depth: Unless otherwise noted (5 5/8 at plumbing walls).
 3. Hat-Shaped, Rigid Furring Channels: ASTM C 645, **7/8 inch (22.2 mm)** deep.
 - a. Minimum Base Metal Thickness: 25 gauge.
 4. Resilient Furring Channels: **3/4 inch** deep members designed to reduce sound transmission.
 - a. Configuration: **Hat shaped.**
- F. Grid Suspension System for Ceilings: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.
 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 2. Products: Subject to compliance with requirements, provide one of the following:
 - a. Armstrong World Industries, Inc.; Drywall Grid Systems.
 - b. Chicago Metallic Corporation; **640-C** Drywall Furring System.
 - c. USG Corporation; Drywall Suspension System.

2.3 STEEL FRAMING FOR FRAMED ASSEMBLIES

- A. Steel Studs and Runners: ASTM C 645.

1. Minimum Base-Metal Thickness: 25 gauge with 20 gauge for high impact drywall.
 2. Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.
 - a. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) Steel Network Inc. (The); **VertiClip SLD** or **VertiTrack VTD** Series.
 - 2) Superior Metal Trim; Superior Flex Track System (SFT).
- B. Cold-Rolled Channel Bridging: **0.0538-inch (1.37-mm)** bare-steel thickness, with minimum **1/2-inch- (12.7-mm-)** wide flanges.
1. Depth: **1-1/2 inches (38.1 mm)**.
 2. Clip Angle: Not less than **1-1/2 by 1-1/2 inches (38.1 by 38.1 mm)**, **0.068-inch- (1.73-mm-)** thick, galvanized steel.

2.4 AUXILIARY MATERIALS (As needed)

- A. General: Provide auxiliary materials that comply with referenced installation standards.
1. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
- B. Isolation Strip at Exterior Walls: Provide **one of** the following:
1. Asphalt-Saturated Organic Felt: ASTM D 226, Type I (No. 15 asphalt felt), nonperforated.
 2. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, **1/8 inch (3.2 mm)** thick, in width to suit steel stud size.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance.
1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure

have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.

1. Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.

B. Coordination with Sprayed Fire-Resistive Materials:

1. Before sprayed fire-resistive materials are applied, attach offset anchor plates or ceiling runners (tracks) to surfaces indicated to receive sprayed fire-resistive materials. Where offset anchor plates are required, provide continuous plates fastened to building structure not more than 24 inches (600 mm) o.c.
2. After sprayed fire-resistive materials are applied, remove them only to extent necessary for installation of non-load-bearing steel framing. Do not reduce thickness of fire-resistive materials below that required for fire-resistance ratings indicated. Protect adjacent fire-resistive materials from damage.

3.3 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C 754, except comply with framing sizes and spacing indicated.
1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.
- B. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
- C. Install bracing at terminations in assemblies.
- D. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.4 INSTALLING SUSPENSION SYSTEMS

- A. Install suspension system components in sizes and spacings indicated on Drawings, but not less than those required by referenced installation standards for assembly types and other assembly components indicated.
- B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.
- C. Suspend hangers from building structure as follows:
1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.
 - a. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support standard suspension

system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.

- a. Size supplemental suspension members and hangers to support ceiling loads within **performance limits established by referenced installation standards.**
 3. Wire Hangers: Secure 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 hangers to deteriorate or otherwise fail.
 4. Flat Hangers: Secure 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.
 5. Do not attach hangers to steel roof deck.
 6. Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.
 7. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.
 8. Do not connect or suspend steel framing from ducts, pipes, or conduit.
- D. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.
- E. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.
- F. Installation Tolerances: Install suspension systems that are level to within **1/8 inch in 12 feet (3 mm in 3.6 m)** measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

3.5 INSTALLING FRAMED ASSEMBLIES

- A. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.
- B. Install studs so flanges within framing system point in same direction.
 1. Space studs as follows:
 - a. Single-Layer Application: **16 inches (406 mm)** o.c., unless otherwise indicated.
 - b. Multilayer Application: **16 inches (406 mm)** o.c., unless otherwise indicated.
 - c. Tile backing panels: **16 inches (406 mm) 400 mm** o.c., unless otherwise indicated.
- C. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling.
 1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
 2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.

- a. Install two studs at each jamb, unless otherwise indicated.
 - b. Install cripple studs at head adjacent to each jamb stud, with a minimum **1/2-inch (12.7-mm)** clearance from jamb stud to allow for installation of control joint in finished assembly.
 - c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure (if needed for forces opening / closing doors).
3. Other Framed Openings: Frame openings other than door openings the same as required for door openings, unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
 4. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.
 - a. Firestop Track: Where indicated, install to maintain continuity of fire-resistance-rated assembly indicated.
 5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.
 6. Curved Partitions:
 - a. Bend track to uniform curve and locate straight lengths so they are tangent to arcs.
 - b. Begin and end each arc with a stud, and space intermediate studs equally along arcs. On straight lengths of not less than 2 studs at ends of arcs, place studs **6 inches (150 mm)** o.c.
- D. Direct Furring:
1. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced **24 inches (610 mm)** o.c.
- E. Installation Tolerance: Install each framing member so fastening surfaces vary not more than **1/8 inch (3 mm)** from the plane formed by faces of adjacent framing.
- F. Stud wall bridging (horizontal) any 25 ga studs 12' 0" or taller shall have horizontal bridging at half way point of height.

END OF SECTION 09 11 10

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SECTION 09 25 00 - GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Interior gypsum board.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

1.3 STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against damage from weather, condensation, direct sunlight, construction traffic, and other causes. Stack panels flat to prevent sagging.

1.4 PROJECT CONDITIONS

A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.

B. Do not install interior products until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 PANELS, GENERAL

- A. Size: Provide in maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.2 INTERIOR GYPSUM BOARD

- A. General: Complying with ASTM C 1396/C 1396M, as applicable to type of gypsum board indicated and whichever is more stringent.

- 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

- a. American Gypsum Co.
- b. BPB America Inc.
- c. G-P Gypsum.
- d. National Gypsum Company.
- e. USG Corporation.

- B. Standard Non Rated:

- 1. Thickness: 5/8"
- 2. Long Edges: Tapered and featured (rounded or beveled) for prefilling.

- C. Ceiling Type: Manufactured to have more sag resistance than regular-type gypsum board.

- 1. Thickness: 5/8 inch
- 2. Long Edges Tapered and featured (rounded or beveled) for prefilling.

- D. High impact – fiber reinforced Abuse-Resistant Type: Manufactured to produce greater resistance to surface indentation, through-penetration (impact resistance), and abrasion than standard, regular-type and Type X gypsum board, equal to U.S. Gypsum fiberglass AR interior panels.

2.3 TRIM ACCESSORIES

- A. Interior Trim: ASTM C 1047.

- 1. Material: Galvanized or aluminum-coated steel sheet
- 2. Shapes:
 - a. Cornerbead.

- b. Bullnose bead.
- c. LC-Bead: J-shaped; exposed long flange receives joint compound.
- d. L-Bead: L-shaped; exposed long flange receives joint compound.
- e. U-Bead: J-shaped; exposed short flange does not receive joint compound.
- f. Expansion (control) joint.
- g. Curved-Edge Cornerbead: With notched or flexible flanges.

2.4 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475/C 475M.
- B. Joint Tape:
 - 1. Interior Gypsum Wallboard: Paper.
- C. Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.
 - 1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
 - 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.
 - a. Use setting-type compound for installing paper-faced metal trim accessories.
 - 3. Fill Coat: For second coat, use drying-type, all-purpose compound.
 - 4. Finish Coat: For third coat, use drying-type, all-purpose compound.
 - 5. Skim Coat: For final coat of Level 5 finish, use drying-type, all-purpose compound.

2.5 AUXILIARY MATERIALS (as needed)

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
- B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
- C. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
 - 1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
 - 2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.
- D. Sound Attenuation Blankets: As specified in Division 7 Section "Building Insulation"

- E. Acoustical Sealant: As specified in Division 7 Section "Joint Sealants."
- F. Thermal Insulation: As specified in Division 7 Section "Building Insulation."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames and framing, for compliance with requirements and other conditions affecting performance.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.
- B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.
- D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- E. Form control and expansion joints with space between edges of adjoining gypsum panels.
- F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
 - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
 - 2. Fit gypsum panels around ducts, pipes, and conduits.
 - 3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- wide joints to install sealant.

- G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) wide spaces at these locations, and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- I. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.

3.3 APPLYING INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
 - 1. Regular Type: Vertical or horizontal surfaces, unless otherwise indicated.
 - 2. Ceiling Type: Ceiling surfaces.
- B. Single-Layer Application:
 - 1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing, unless otherwise indicated.
 - 2. On partitions/walls, apply gypsum panels vertically (parallel to framing) or horizontally (perpendicular to framing), unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
 - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
 - b. At stairwells and other high walls, install panels horizontally, unless otherwise indicated or required by fire-resistance-rated assembly.
 - 3. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
 - 4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.
- C. Multilayer Application:
 - 1. On ceilings, apply gypsum board indicated for base layers before applying base layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints 1 framing member, 16 inches minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.

2. 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.
 3. On Z-furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.
 4. Fastening Methods: Fasten base layers and face layers separately to supports with screws
- D. Laminating to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer's written recommendations and temporarily brace or fasten gypsum panels until fastening adhesive has set.

3.4 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.
- C. Interior Trim: Install in the following locations:
 1. Cornerbead: Use at outside corners.
 2. Bullnose Bead: Use at outside corners.
 3. LC-Bead: Use at exposed panel edges.
 4. L-Bead: Use (where needed).
 5. U-Bead: Use at exposed panel edges.
 6. Control joint (See 3.7)

3.5 FINISHING GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints, rounded or beveled edges, and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:

1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
2. Level 4 finish:
 - a. Primer and its application to surfaces are specified in other Division 9 Sections.

3.6 PROTECTION

- A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- B. Remove and replace panels that are wet, moisture damaged, and mold damaged.
 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

3.7 CRACK CONTROL

- a. Space control joints not more than 40' o.c. ceilings.
- b. Space control joints where ceiling framing and furring changes direction.
- c. Space control joints in wall no more than 30'-0" o.c.

END OF SECTION 09 25 00

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SECTION 09 65 13 - RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Resilient base (Vinyl Base).
 - 2. Resilient molding accessories.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Initial Selection: For each type of product indicated.
- C. Samples for Verification: For each type of product indicated, in manufacturer's standard-size Samples but not less than 12 inches long, of each resilient product color, texture, and pattern required.
- D. Product Schedule: For resilient products. Use same designations indicated on Drawings.

1.3 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

1.5 PROJECT CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F , in spaces to receive resilient products during the following time periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F
- C. Install resilient products after other finishing operations, including painting, have been completed.

1.6 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.
 - 1. Furnish not less than 10 linear feet will for every 500 linear feet or fraction thereof, of each type, color, pattern, and size of resilient product installed.

PART 2 - PRODUCTS

2.1 RESILIENT BASE

- A. Resilient Base:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Armstrong World Industries, Inc.
 - b. Burke Mercer Flooring Products; Division of Burke Industries, Inc.
 - c. Johnsonite.
 - d. Roppe Corporation, USA.
- B. Resilient Base Standard: ASTM F 1861.
 - 1. Material Requirement: Type TV (vinyl, thermoplastic).
 - 2. Manufacturing Method: Group I (solid, homogeneous).
 - 3. Style: Cove (base with toe)
- C. Minimum Thickness: 1/8 inch.

- D. Height: 6 inches
- E. Lengths: Cut lengths 48 inches (1219 mm) long or coils in manufacturer's standard length.
- F. Outside Corners: Preformed.
- G. Inside Corners: Preformed.
- H. Finish: As selected by Architect from manufacturer's full range.
- I. Colors and Patterns: As selected by Architect from full range of industry colors.

2.2 RESILIENT MOLDING ACCESSORY (as needed)

- A. Resilient Molding Accessory:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are limited to, the following:
 - a. Armstrong World Industries Inc.
 - b. Burke Mercer Flooring Products; Division of Burke Industries, Inc.
 - c. Johnsonite.
 - d. Roppe Corporation, USA.
- B. Description: Cap for cove carpet Cap for cove resilient floor covering Carpet edge for glue-down applications Reducer strip for resilient floor covering Joiner for LVT and carpet Transition strips. (See Division 9 Section "Tiling" for transition strip between tile and carpet)
- C. Material: Vinyl.
- D. Colors and Patterns: As selected by Architect from full range of industry colors.

2.3 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.
 - 1. Use adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

- a. Cove Base Adhesives: Not more than 50 g/L.
 - b. Rubber Floor Adhesives: Not more than 60 g/L.
- C. Metal Edge Strips: Extruded aluminum with mill finish of width shown, of height required to protect exposed edges of tiles, and in maximum available lengths to minimize running joints.
- D. Floor Polish: Provide protective liquid floor polish products as recommended by manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Concrete Substrates for Resilient Stair Treads and Accessories: Prepare according to ASTM F 710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
 - 3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer.
 - 4. Moisture Testing: Perform tests recommended by manufacturer and as follows. Proceed with installation only after substrates pass testing.
 - a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
 - b. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have maximum 75 percent relative humidity level measurement.

- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install resilient products until they are same temperature as the space where they are to be installed.
 - 1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
- E. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.3 RESILIENT BASE INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- C. Install resilient base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- E. Do not stretch resilient base during installation.
- F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.
- G. Preformed Corners: Install preformed corners before installing straight pieces.

3.4 RESILIENT ACCESSORY INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient accessories.
- B. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of carpet and resilient floor covering that would otherwise be exposed.

3.5 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protection of resilient products.

- B. Perform the following operations immediately after completing resilient product installation:
 - 1. Remove adhesive and other blemishes from exposed surfaces.
 - 2. Sweep and vacuum surfaces thoroughly.
 - 3. Damp-mop surfaces to remove marks and soil.
- C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Cover resilient products until Substantial Completion.

END OF SECTION 09 65 13

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SECTION 09 65 19 - RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Luxury Vinyl Tile

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For each type of floor tile. Include floor tile layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
 - 1. Show details of special patterns.
- C. Samples for Initial Selection: For each type of floor tile indicated.
- D. Samples for Verification: Full-size units of each color and pattern of floor tile required.
- E. Maintenance Data: For each type of floor tile to include in maintenance manuals.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for floor tile installation and seaming method indicated.
 - 1. Engage an installer who employs workers for this Project who are trained or certified by manufacturer for installation techniques required.
- B. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

- C. Simple-Source Responsibility: provide types of flooring and accessories supplied by one manufacturer, include leveling and patching compounds and adhesives.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 65 deg F or more than 90 deg F. Store floor tiles on flat surfaces.

1.5 PROJECT CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive floor tile during the following time periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
- C. Close spaces to traffic during floor tile installation.
- D. Close spaces to traffic for 48 hours after floor tile installation.
- E. Install floor tile after other finishing operations, including painting, have been completed.

1.6 WARRANTY

- A. Submit a written warranty executed by the manufacturer agreeing to repair or replace flooring that fails within the warranty period.
- B. Limited Warranty Period: Minimum 10 Years.
- C. The Limited 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.
- D. For the Limited Warranty to be valid, this product is required to be installed using appropriate installation system or warranty will be void.

1.7 EXTRA MATERIALS

- A. Furnish extra materials from same production run as products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Floor Tile: Furnish 1 box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

PART 2 - PRODUCTS

2.1 LUXURY VINYL TILE

- A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Armstrong World Industries, Inc.;
 - 2. Mannington Mills, Inc.;
 - 3. Shaw
 - 4. Tandus-Centiva
 - 5. Forbo Flooring Systems
- B. Tile Standard: ASTM E 648, Class 1.
- C. Wear Finish: – Two Coats UV Cured Acrylic
- D. Construction: A
- E. Installation: Glue down
- F. Thickness: 2.5 mm minimum
- G. Size: As selected by Architect
- H. Colors and Patterns: As selected by Architect from full range of industry colors.

2.2 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by manufacturer to suit floor tile and substrate conditions indicated.
 - 1. Use adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

- a. Rubber Floor Adhesives: Not more than 60 g/L.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Compliance: Comply with manufacturer's product data, including technical bulletins, product catalog, installation instructions and product carton instructions for installation and maintenance procedures as needed.
- B. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- C. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Concrete Substrates: Prepare according to ASTM F 710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
 - 3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
 - 4. Moisture Testing: Perform tests recommended by manufacturer and as follows. Proceed with installation only after substrates pass testing.
 - a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) in 24 hours.
 - b. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75% relative humidity level measurement.
- C. Access Flooring Panels: Remove protective film of oil or other coating using method recommended by access flooring manufacturer.

- D. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.
- E. Do not install floor tiles until they are same temperature as space where they are to be installed.
 - 1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
- F. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.3 FLOOR TILE INSTALLATION

- A. Comply with manufacturer's written instructions for installing floor tile.
- B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
 - 1. Lay tiles in pattern indicated.
- C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
- D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.
- E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent, nonstaining marking device.
- G. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in finished floor areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.
- H. Adhere floor tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protection of floor tile.
- B. Perform the following operations immediately after completing floor tile installation:
 - 1. Remove adhesive and other blemishes from exposed surfaces.
 - 2. Sweep and vacuum surfaces thoroughly.
 - 3. Damp-mop surfaces to remove marks and soil.
- C. Protect floor tile products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Cover floor tile until Substantial Completion.

END OF SECTION 09 65 19

**FLORIDA A&M UNIVERSITY
RATTLER POINT WASH HOUSE BUILD-OUT
CONSTRUCTION DOCUMENTS
SEPTEMBER 13, 2024**

SECTION 09 91 13 - EXTERIOR PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes surface preparation and the application of paint systems on the following exterior substrates:
 - 1. Galvanized metal (Hollow Metal).
 - 2. Trim fabrications.
- B. Related Sections include the following:
 - 1. Division 5 Sections for shop priming of metal substrates with primers specified in this Section.
 - 2. Division 9 Section "Interior Painting" for surface preparation and the application of paint systems on interior substrates.
 - 3. Division 9 Painting Sections for special use coatings

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Initial Selection: For each type of topcoat product indicated.
- C. Samples for Verification: For each type of paint system and each color and gloss of topcoat indicated.
 - 1. Submit Samples on rigid backing, 8 inches (200 mm) square.
 - 2. Step coats on Samples to show each coat required for system.
 - 3. Label each coat of each Sample.
 - 4. Label each Sample for location and application area.
- D. Product List: For each product indicated, include the following:

1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
2. Printout of current "MPI Approved Products List" for each product category specified in Part 2, with the proposed product highlighted.

1.4 QUALITY ASSURANCE

A. MPI Standards:

1. Products: Complying with MPI standards indicated and listed in "MPI Approved Products List."
2. Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting Specification Manual" for products and paint systems indicated.

B. Mockups: Apply benchmark samples of each paint system indicated and each color and finish selected to verify preliminary selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
 - b. Other Items: Architect will designate items or areas required.
2. Final approval of color selections will be based on benchmark samples.
 - a. If preliminary color selections are not approved, apply additional benchmark samples of additional colors selected by Architect at no added cost to Owner.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.6 PROJECT CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).

- B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

1.7 EXTRA MATERIALS

- A. Furnish extra materials described below that are from same production run (batch mix) as materials applied and that are packaged for storage and identified with labels describing contents.
 - 1. Quantity: Furnish an additional [5] percent, but not less than [1 gal. (3.8 L)] of each material and color applied.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Benjamin Moore & Co.
 - 2. Benjamin Moore & Co., Limited (Canada).
 - 3. California Paints.
 - 4. Duron, Inc.
 - 5. ICI Paints.
 - 6. Porter Paints.
 - 7. PPG Architectural Finishes, Inc.
 - 8. Sherwin-Williams Company (The).

2.2 PAINT, GENERAL

- A. Material Compatibility:
 - 1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 - 2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- B. Colors: As selected by Architect from manufacturer's full range..

2.3 PRIMERS/SEALERS

- A. Alkali-Resistant Primer: MPI #3.
 - 1. VOC Content: E Range of E1, E2, or E3.
- B. Bonding Primer (Water Based): MPI #17.
 - 1. VOC Content: E Range of E1, E2, or E3.
- C. Bonding Primer (Solvent Based): MPI #69.
 - 1. VOC Content: E Range of E1, E2, or E3.

2.4 METAL PRIMERS

- A. Alkyd Anticorrosive Metal Primer: MPI #79.
 - 1. VOC Content: E Range of E1 or E2.
- B. Quick-Drying Alkyd Metal Primer: MPI #76.
 - 1. VOC Content: E Range of E1 or E2.

2.5 EXTERIOR LATEX PAINTS

- A. Exterior Latex (Flat): MPI #10 (Gloss Level 1).
 - 1. VOC Content: E Range of E1, E2, or E3.
- B. Exterior Latex (Semigloss): MPI #11 (Gloss Level 5).
 - 1. VOC Content: E Range of E1, E2, or E3.

2.6 EXTERIOR ALKYD PAINTS

- A. Exterior Alkyd Enamel (Semigloss): MPI #94 (Gloss Level 5).
 - 1. VOC Content: E Range of E1 or E2.
 - 2. VOC Content: E Range of E1 or E2.

2.7 QUICK-DRYING ENAMELS

- A. Quick-Drying Enamel (Semigloss): MPI #81 (Gloss Level 5).

1. VOC Content: E Range of E1, E2, or E3.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 1. Concrete: 12 percent.
 2. Wood: 15 percent.
- C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- D. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.
 1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.
- B. Remove plates, machined surfaces, and similar items already in place that are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
 2. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
- C. Clean substrates of substances that could impair bond of paints, including dirt, oil, grease, and incompatible paints and encapsulants.
 1. Remove incompatible primers and reprime substrate with compatible primers as required to produce paint systems indicated.

- D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- E. Galvanized-Metal Substrates: Hollow metal remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions.
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - 2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 FIELD QUALITY CONTROL

- A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure at any time and as often as Owner deems necessary during the period when paints are being applied:
 - 1. Owner will engage the services of a qualified testing agency to sample paint materials being used. Samples of material delivered to Project site will be taken, identified, sealed, and certified in presence of Contractor.
 - 2. Testing agency will perform tests for compliance of paint materials with product requirements.
 - 3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying-paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 EXTERIOR PAINTING SCHEDULE

- A. Concrete Substrates, Nontraffic Surfaces:
 - 1. Latex System: MPI EXT 3.1A.
 - a. Prime Coat: Exterior latex matching topcoat.
 - b. Intermediate Coat: Exterior latex matching topcoat.
 - c. Topcoat: Exterior latex (flat).
- B. Galvanized-Metal Substrates: (Hollow Metal)
 - 1. Latex System: MPI EXT 5.3A.
 - a. Prime Coat: Cementitious galvanized-metal primer.
 - b. Intermediate Coat: Exterior latex matching topcoat.
 - c. Topcoat: Exterior latex (semigloss)
- C. Exterior trim.
 - 1. Latex System: MPI EXT 6.4K.
 - a. Prime Coat: Exterior latex wood primer.
 - b. Intermediate Coat: Exterior latex matching topcoat.
 - c. Topcoat: Exterior latex (semigloss).
 - 2. Latex Over Alkyd Primer System: MPI EXT 6.4G.
 - a. Prime Coat: Exterior alkyd wood primer.
 - b. Intermediate Coat: Exterior latex matching topcoat.
 - c. Topcoat: Exterior latex (semigloss).

D. Plastic Trim Fabrication Substrates:

1. Latex System: MPI EXT 6.8A.
 - a. Prime Coat: Bonding primer (solvent based).
 - b. Intermediate Coat: Exterior latex matching topcoat.
 - c. Topcoat: Exterior latex (semigloss)

END OF SECTION 09 91 13

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**FLORIDA A&M UNIVERSITY
RATTLER POINT WASH HOUSE BUILD-OUT
CONSTRUCTION DOCUMENTS
SEPTEMBER 13, 2024**

SECTION 09912 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes surface preparation and the application of paint systems on the following interior substrates:
 - 1. Concrete (where shown).
 - 2. Concrete masonry units (CMU) (Where shown).
 - 3. Steel.
 - 4. Galvanized metal.
 - 5. Wood.
 - 6. Gypsum board.
- B. Related Sections include the following:
 - 1. Division 5 Sections for shop priming of metal substrates with primers specified in this Section.
 - 2. Division 9 painting Sections for special-use coatings.
 - 3. Division 9 painting Sections for Exteriors

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Initial Selection: For each type of topcoat product indicated.
- C. Product List: For each product indicated, include the following:
 - 1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
 - 2. Printout of current "MPI Approved Products List" for each product category specified in Part 2, with the proposed product highlighted.

1.4 QUALITY ASSURANCE

A. MPI Standards:

1. Products: Complying with MPI standards indicated and listed in "MPI Approved Products List."
2. Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting Specification Manual" for products and paint systems indicated.

B. Mockups: Apply benchmark samples of each paint system indicated and each color and finish selected to verify preliminary selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.
 - a. Wall Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
 - b. Other Items: Architect will designate items or areas required.
2. Apply benchmark samples after permanent lighting and other environmental services have been activated.
3. Final approval of color selections will be based on benchmark samples.
 - a. If preliminary color selections are not approved, apply additional benchmark samples of additional colors selected by Architect at no added cost to Owner.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.6 PROJECT CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).

B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Benjamin Moore & Co.
 2. Columbia Paint & Coatings.
 3. Coronado Paint.
 4. Frazee Paint.
 5. General Paint.
 6. Griggs Paint.
 7. Kryton Canada Corporation.
 8. Porter Paints.
 9. PPG Architectural Finishes, Inc.
 10. Sherwin-Williams Company (The).

2.2 PAINT, GENERAL

- A. Material Compatibility:
1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- B. Chemical Components 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) and the following chemical restrictions; these requirements do not apply to primers or finishes that are applied in a fabrication or finishing shop:
1. Flat Paints and Coatings: VOC content of not more than 50 g/L.
 2. Nonflat Paints and Coatings: VOC content of not more than 150 g/L.
 3. Aromatic Compounds: Paints and coatings shall not contain more than 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
 4. Restricted Components: Paints and coatings shall not contain any of the following:
 - a. Acrolein.
 - b. Acrylonitrile.
 - c. Antimony.

- d. Benzene.
- e. Butyl benzyl phthalate.
- f. Cadmium.
- g. Di (2-ethylhexyl) phthalate.
- h. Di-n-butyl phthalate.
- i. Di-n-octyl phthalate.
- j. 1,2-dichlorobenzene.
- k. Diethyl phthalate.
- l. Dimethyl phthalate.
- m. Ethylbenzene.
- n. Formaldehyde.
- o. Hexavalent chromium.
- p. Isophorone.
- q. Lead.
- r. Mercury.
- s. Methyl ethyl ketone.
- t. Methyl isobutyl ketone.
- u. Methylene chloride.
- v. Naphthalene.
- w. Toluene (methylbenzene).
- x. 1,1,1-trichloroethane.
- y. Vinyl chloride.

C. Colors: [As selected by Architect from manufacturer's full range].

2.3 BLOCK FILLERS

A. Interior/Exterior Latex Block Filler: MPI #4.

- 1. VOC Content: E Range of E2 or E3.

2.4 PRIMERS/SEALERS

A. Interior Latex Primer/Sealer: MPI #50.

- 1. VOC Content: E Range of E2 or E3.
- 2. Environmental Performance Rating: EPR 1.

2.5 METAL PRIMERS

A. Quick-Drying Alkyd Metal Primer: MPI #76.

- 1. VOC Content: E Range of E2 or E3.

B. Waterborne Galvanized-Metal Primer: MPI #134.

1. VOC Content: E Range of E2 or E3.
2. Environmental Performance Rating: EPR 1.

2.6 LATEX PAINTS

- A. Interior Latex (Eggshell): MPI #52 (Gloss Level 3).
1. VOC Content: E Range of E2 or E3.
 2. Environmental Performance Rating: EPR 1

2.7 ALKYD PAINTS

- A. Interior Alkyd (Semigloss): MPI #47 (Gloss Level 5).
1. VOC Content: E Range of E1 or E2.
 2. Environmental Performance Rating: EPR 1

2.8 QUICK-DRYING ENAMELS

- A. Quick-Drying Enamel (High Gloss): MPI #96 (Gloss Level 7).
1. VOC Content: E Range of E2 or E3.

2.9 FLOOR COATINGS

- A. Interior/Exterior Clear Concrete Floor Sealer (Water Based): MPI #99.
1. VOC Content: E Range of E2 or E3.

2.10 STAINED WOOD

- A. Water-Based Varnish over Stain System MPI INT 6.3W:
1. Stain Coat: Stain, semitransparent, for interior wood MPI #90.
 - a. First Intermediate Coat: Water-based varnish matching topcoat.
 - b. Second Intermediate Coat: Water-based varnish matching topcoat.
 - c. Topcoat: Varnish, water based, clear, satin (MPI Gloss Level 4), MPI #128.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - 1. Concrete: 12 percent.
 - 2. Wood: 15 percent.
 - 3. Gypsum Board: 12 percent.
- C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- D. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.
 - 1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates indicated.
- B. Remove plates, machined surfaces, and similar items already in place that are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
 - 2. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
- C. Clean substrates of substances that could impair bond of paints, including dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers as required to produce paint systems indicated.
- D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.

- E. Concrete Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- F. Steel Substrates: Remove rust and loose mill scale. Clean using methods recommended in writing by paint manufacturer.
- G. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
- H. Wood Substrates:
 - 1. Scrape and clean knots, and apply coat of knot sealer before applying primer.
 - 2. Sand surfaces that will be exposed to view, and dust off.
 - 3. Prime edges, ends, faces, undersides, and backsides of wood.
 - 4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.
- I. Gypsum Board Substrates: Do not begin paint application until finishing compound is dry and sanded smooth.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions.
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - 2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 - 3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- E. Painting Mechanical and Electrical Work: Paint items exposed in equipment rooms and occupied spaces including, but not limited to, the following:

1. Mechanical Work:
 - a. Uninsulated metal piping.
 - b. Uninsulated plastic piping.
 - c. Pipe hangers and supports.
 - d. Tanks that do not have factory-applied final finishes.
 - e. Visible portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets.
 - f. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
 - g. Mechanical equipment that is indicated to have a factory-primed finish for field painting.

2. Electrical Work:
 - a. Switchgear.
 - b. Panelboards.
 - c. Electrical equipment that is indicated to have a factory-primed finish for field painting.

3.4 FIELD QUALITY CONTROL

- A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure at any time and as often as Owner deems necessary during the period when paints are being applied:
 1. Owner will engage the services of a qualified testing agency to sample paint materials being used. Samples of material delivered to Project site will be taken, identified, sealed, and certified in presence of Contractor.
 2. Testing agency will perform tests for compliance with product requirements.
 3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying-paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 INTERIOR PAINTING SCHEDULE

A. Concrete Substrates, Nontraffic Surfaces:

- 1. Latex System: MPI INT 3.1E.
 - a. Prime Coat: Interior latex matching topcoat.
 - b. Intermediate Coat: Interior latex matching topcoat.
 - c. Topcoat: Interior latex (flat)

B. CMU Substrates:

- 1. Latex System: MPI INT 4.2A.
 - a. Prime Coat: Interior/exterior latex block filler.
 - b. Intermediate Coat: Interior latex matching topcoat.
 - c. Topcoat: Interior latex (eggshell)

C. Steel Substrates:

- 1. Quick-Drying Enamel System: MPI INT 5.1A.
 - a. Prime Coat: Quick-drying alkyd metal primer.
 - b. Intermediate Coat: Quick-drying enamel matching topcoat.
 - c. Topcoat: Quick-drying enamel (semigloss)

D. Galvanized-Metal Substrates:

- 1. Latex Over Waterborne Primer System: MPI INT 5.3J.
 - a. Prime Coat: Waterborne galvanized-metal primer.
 - b. Intermediate Coat: Interior latex matching topcoat.
 - c. Topcoat: Interior latex (semigloss).

E. Dressed Lumber Substrates: Including doors Wood sealer with two coats of clear polyutherne.

F. Gypsum Board Substrates:

- 1. Latex System: MPI INT 9.2A.

- a. Prime Coat: Interior latex primer/sealer.
- b. Intermediate Coat: Interior latex matching topcoat.
- c. Topcoat: Interior latex (eggshell).

G. Cotton or Canvas Insulation-Covering Substrates: Including pipe and duct coverings

1. Latex System: MPI INT 10.1A.

- a. Prime Coat: Interior latex primer/sealer.
- b. Intermediate Coat: Interior latex matching topcoat.
- c. Topcoat: Interior latex (flat).

END OF SECTION 09 91 23

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SECTION 09 96 00 - HIGH-PERFORMANCE COATINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes surface preparation and application of high-performance coating systems on the following substrates: (Where called for)
 - 1. Interior Substrates:
 - a. Concrete masonry units (CMU).
 - b. Gypsum board.
- B. Related Sections include the following:
 - 1. Division 9 painting Sections for exterior/interior painting.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Initial Selection: For each type of finish-coat product indicated.
- C. Product List: For each product indicated. Cross-reference products to coating system and locations of application areas. Use same designations indicated on Drawings and in schedules.

1.4 QUALITY ASSURANCE

- A. Master Painters Institute (MPI) Standards:
 - 1. Products: Complying with MPI standards indicated and listed in "MPI Approved Products List."

2. Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting Specification Manual" for products and coating systems indicated.
- B. Mockups: Apply benchmark samples of each coating system indicated to verify preliminary selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Architect will select one surface to represent surfaces and conditions for application of each type of coating and substrate.
 - a. Wall and Ceiling Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
 - b. Other Items: Architect will designate items or areas required.
 2. Apply benchmark samples after permanent lighting and other environmental services have been activated.
 3. Final approval of color selections will be based on benchmark samples.
 - a. If preliminary color selections are not approved, apply additional benchmark samples of additional colors selected by Architect at no added cost to Owner.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).
1. Maintain containers in clean condition, free of foreign materials and residue.
 2. Remove rags and waste from storage areas daily.

1.6 PROJECT CONDITIONS

- A. Apply coatings only when temperature of surfaces to be coated and surrounding air temperatures are between 50 and 95 deg F (10 and 35 deg C).
- B. Do not apply coatings in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

1.7 EXTRA MATERIALS

- A. Furnish extra materials described below that are from same production run (batch mix) as materials applied and that are packaged for storage and identified with labels describing contents.
1. Quantity: Furnish an additional 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

PART 2 - PRODUCTS

2.1 HIGH-PERFORMANCE COATINGS, GENERAL

A. Material Compatibility:

1. Provide materials for use within each coating system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. Provide products of same manufacturer for each coat in a coating system.

B. Chemical Components of Interior Paints and Coatings: Provide products that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24) and the following chemical restrictions:

1. Flat Paints and Coatings: VOC content of not more than 50 g/L.
2. Nonflat Paints and Coatings: VOC content of not more than 150 g/L.
3. Anticorrosive Coatings: VOC content of not more than 250 g/L.
4. Stains: VOC content of not more than 250 g/L.
5. Aromatic Compounds: Paints and coatings shall not contain more than 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing 1 or more benzene rings).
6. Restricted Components: Paints and coatings shall not contain any of the following:
 - a. Acrolein.
 - b. Acrylonitrile.
 - c. Antimony.
 - d. Benzene.
 - e. Butyl benzyl phthalate.
 - f. Cadmium.
 - g. Di (2-ethylhexyl) phthalate.
 - h. Di-n-butyl phthalate.
 - i. Di-n-octyl phthalate.
 - j. 1,2-dichlorobenzene.
 - k. Diethyl phthalate.
 - l. Dimethyl phthalate.
 - m. Ethylbenzene.
 - n. Formaldehyde.
 - o. Hexavalent chromium.
 - p. Isophorone.
 - q. Lead.
 - r. Mercury.
 - s. Methyl ethyl ketone.
 - t. Methyl isobutyl ketone.
 - u. Methylene chloride.

- v. Naphthalene.
- w. Toluene (methylbenzene).
- x. 1,1,1-trichloroethane.
- y. Vinyl chloride.

C. Colors: As selected by Architect from manufacturer's full range.

2.2 BLOCK FILLERS

A. Epoxy Block Filler: MPI #116.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Cloverdale Paint; Epoxy Block Filler, 83065.
 - b. Columbia Paint & Coatings; [Carboline, Carboguard, 954HB] [Insl-x, Epoxy Block Filler, EXP 120].
 - c. Coronado Paint; Polyamide Epoxy Block Filler, 101-11.
 - d. Diamond Vogel Paints; V-Cote 100, Acrylic Epoxy Block Filler, MC-1234.
 - e. Frazee Paint; Ameron, Amerlock 400 BF, 400 BF.
 - f. General Paint; Ameron, Amerlock Block Filler, 400BF.
 - g. ICI [Paints; Devoe Coatings, Devran 224HS, 224HS] [Paints; Devoe Coatings, Bar-Rust 231, 231] [Paints; Devoe Coatings, Bar-Rust 236, 236] [Devoe (Canada); Devoe, Devran High Build Epoxy, 224HS] [Devoe (Canada); ICI Devoe, Devran 224, 224KXXXX].
 - h. Miller Paint; PPG Aquapon, Polyamide Epoxy Block Filler, 97-685 Series.
 - i. PARA Paints; Insl-x, Epoxy Blockfiller, EXP 120.
 - j. Parker Paint Mfg. Co. Inc.; Ameron, Amerlock 400 BF, 400BF.
 - k. PPG Architectural Finishes, Inc.; Aquapon, Epoxy Block Filler, 97-685.
 - l. Rodda Paint Co.; Carboline, Carboguard 954HB.
 - m. Sherwin-Williams Company (The); Industrial & Marine, Kem Cati-Coat HS Epoxy Filler/Sealer, B24W400/V400 S.
 - n. Spectra-Tone; Insl-x, Epoxy Block Filler, EXP 120.
2. VOC Content: Minimum E Range of E1, E2, or E3.

2.3 INTERIOR PRIMERS/SEALERS

A. Interior Latex Primer/Sealer: MPI #50.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
2. Products: Subject to compliance with requirements, provide one of the following:

- a. Benjamin Moore & Co.; [(Canada), Moorespec, Int. Acrylic Latex Primer/Sealer, 586-00] [Regal, First Coat Latex Primer/Undercoater, 216] [Moorcraft, Latex Undercoater & Primer Sealer, 253-00].
 - b. California Paints; ProPrime, Latex Primer White, 54500.
 - c. Cloverdale Paint; Interior Latex Primer Sealer, 05250.
 - d. Columbia Paint & Coatings; [Premium Pro, Interior Latex Enamel Undercoater, 02-735-PP] [Insl-x, Waterbase Primer/Sealer/Stain Killer, AQ-0500].
 - e. Coronado Paint; Super Kote 5000, Latex Primer-Sealer, 40-11.
 - f. Dunn-Edwards Corporation; Eff-Stop, Acrylic Masonry Primer/Sealer, W 709.
 - g. Duron Inc.; Interior Acrylic [Drywall Primer, 04-124] [Latex Undercoater, 04-123].
 - h. Farrell-Calhoun; Perfik-Seal, Interior Latex Primer-Sealer, 380.
 - i. Flex Bon Paints; Interior Alkyd Latex Primer, 1071.
 - j. Frazee Paint; Aqua Seal, Interior Vinyl Acrylic Wall Sealer, 061.
 - k. General Paint; [Breeze, Super Seal Latex, 51-087] [Tradesman, Latex Sealer, 28-080].
 - l. Hirshfield's, Inc.; Hirsfield's Paint Manufacturing, Drywall Primer Interior Latex, 1250.
 - m. ICI Paints[; Prep-N-Prime, PVA Interior Primer Sealer, 1030] [; Prep-N-Prime, Interior Latex Wall Primer, 1000] [; Devoe/Fuller, Wonder-Tones, DR50801] [(Canada); Glidden, Dulux Interior Latex Sealer, 11000] [(Canada); Color Your World, Latex Primer, 9650].
 - n. Insl-x; Aqualock, Waterbase Primer/Sealer/Stain Killer, AQ-0500.
 - o. Iowa Paint Manufacturing Company, Inc.; Prime Line, Hi Hide PVA Primer, 516.
 - p. Kelly-Moore Paints; [Acry-Prime, Interior Latex Primer Sealer, 971] [Enviro-Cote, Interior Latex Primer, 1505].
 - q. Kwal-Howells Paint; Accu-Pro, Interior Latex Flat Drywall Primer, 0890.
 - r. Miller Paint; Kril Primer Sealer, 6040.
 - s. Mills Paint; Superior Quality, Interior Latex Primer Sealer, 133.
 - t. Northern Paint; Colorlox, Hi Hide Latex Primer, 301-49.
 - u. PARA Paints; Prime Tech Hi-Hide Latex Primer, 5799.
 - v. Porter Paints; Interior Latex Sealer, 37725.
 - w. PPG Architectural Finishes, Inc.; Speedhide, Int. Latex Primer Sealer, 6-2.
 - x. Rodda Paint Co.; Scotseal, Heavy Bodied Latex Sealer, 50 7801 1.
 - y. Sherwin-Williams Company (The); [PrepRite, 200 Latex Primer, B28W200] [Quali-Kote, Interior Latex Primer, B28WQ8001].
 - z. Spectra-Tone; Jobmaster, PVA Latex Primer Sealer, 74.
 - aa. Vista Paint; Seal Cote, 155.
3. Environmental Characteristics:
- a. VOC Content:
 - 1) Minimum E Range of E2 or E3.

2) Meets or exceeds LEED requirements for VOC content.

b. Environmental Performance Rating (EPR): Minimum EPR 2 or 3.

2.4 EPOXY COATINGS

A. Epoxy, Cold-Cured, Gloss: MPI #77.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
2. Products: Subject to compliance with requirements, provide one of the following:
 - a. Benjamin Moore & Co.; Polyamide Epoxy Coating, M36/M37.
 - b. [Devoe/Fuller, Guardcote, DP34UXX].
 - c. Miller Paint; PPG Aquapon, Epoxy Cold Cured - Gloss, 95-1.
 - d. Porter Paints; Porterglaze 4000, Gloss Epoxy, 4000.
 - e. PPG Architectural Finishes, Inc.; Aquapon, Epoxy Cold Cured Gloss, 95-1.
 - f. Tower Paint; Epoxy High Gloss Enamel, T8700.
3. VOC Content: Minimum E Range of E2 or E3.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of work.
1. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - a. Concrete: 12 percent.
 - b. Gypsum Board: 12 percent.
 2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 3. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.
 4. Coating application indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates indicated.

- B. Remove plates, machined surfaces, and similar items already in place that are not to be coated. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and coating.
 - 1. After completing coating operations, reinstall items that were removed; use workers skilled in the trades involved.
- C. Clean substrates of substances that could impair bond of coatings, including dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers as required to produce coating systems indicated.
- D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
 - 1. Clean surfaces with pressurized water. Use pressure range of [1500 to 4000 psi
 - 2. Abrasive blast clean surfaces to comply with SSPC-SP 7/NACE No. 4, "Brush-Off Blast Cleaning."
- E. CMU Substrates: Remove efflorescence and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.

3.3 APPLICATION

- A. Apply high-performance coatings according to manufacturer's written instructions.
 - 1. Use applicators and techniques suited for coating and substrate indicated.
 - 2. Coat surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, coat surfaces behind permanently fixed equipment or furniture with prime coat only.
 - 3. Coat back sides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of the same material are to be applied. Tint undercoats to match color of finish coat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through final coat, apply additional coats until cured film has a uniform coating finish, color, and appearance.
- D. Apply coatings to produce surface films without cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections. Produce sharp glass lines and color breaks.

3.4 FIELD QUALITY CONTROL

- A. Owner reserves the right to invoke the following procedure at any time and as often as Owner deems necessary during the period when coatings are being applied:
 - 1. Owner will engage the services of a qualified testing agency to sample coating material being used. Samples of material delivered to Project site will be taken, identified, sealed, and certified in presence of Contractor.
 - 2. Testing agency will perform tests for compliance with specified requirements.
 - 3. Owner may direct Contractor to stop applying coatings if test results show materials being used do not comply with specified requirements. Contractor shall remove noncomplying coating materials from Project site, pay for testing, and recoat surfaces coated with rejected materials. Contractor will be required to remove rejected materials from previously coated surfaces if, on recoating with complying materials, the two coatings are incompatible.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing coating application, clean spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from coating operation. Correct damage by cleaning, repairing, replacing, and recoating, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced coated surfaces.

3.6 INTERIOR HIGH-PERFORMANCE COATING SCHEDULE

- A. CMU Substrates:
 - 1. Epoxy Coating System:
 - a. Prime Coat: Interior/exterior latex block filler, MPI #4.
 - b. Intermediate Coat: Epoxy, cold-cured, gloss, MPI #77.
 - c. Topcoat: Epoxy, cold-cured, gloss, MPI #77.
- B. Gypsum Wallboard:
 - 1. Epoxy Coating System:
 - a. Prime Coat: Interior latex primer/sealer, MPI #50.

- b. Intermediate Coat: Epoxy, cold-cured, gloss, MPI #77.
- c. Topcoat: Epoxy, cold-cured, gloss, MPI #77.

END OF SECTION 09 96 00

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SECTION 10 14 00 - SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
1. Panel signs.

1.2 DEFINITIONS

- A. ADA-ABA Accessibility Guidelines: U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines."

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show fabrication and installation details for signs.
1. Show sign mounting heights, locations of supplementary supports to be provided by others, and accessories.
 2. Provide message list, typestyles, graphic elements, **including tactile characters and Braille**, and layout for each sign.
- C. Samples for Initial Selection: Manufacturer's color charts consisting of actual units or sections of units showing the full range of colors available for the following:
1. Acrylic sheet.
 2. Die-cut vinyl characters and graphic symbols. **Include representative samples of available typestyles and graphic symbols.**
- D. Samples for Verification: For each of the following products and for the full range of color, texture, and sign material indicated, of sizes indicated:
1. Acrylic Sheet: **8 by 10 inches (200 by 250 mm)** for each color required.
 2. Panel Signs: Not less than **12 inches (305 mm)** square **including border**.
- E. Sign Schedule: Use same designations indicated on Drawings.
- F. Qualification Data: For **Installer and fabricator**.

- G. Maintenance Data: For signs to include in maintenance manuals.
- H. Warranty: Special warranty specified in this Section.

1.4 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.
- B. Source Limitations for Signs: Obtain each sign type indicated from one source from a single manufacturer.
- C. Regulatory Requirements: Comply with applicable provisions in **ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1**.

1.5 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when **existing and forecasted** weather conditions permit installation of signs in exterior locations to be performed according to manufacturers' written instructions and warranty requirements.
- B. Field Measurements: Verify recess openings by field measurements before fabrication and indicate measurements on Shop Drawings.

1.6 COORDINATION

- A. Coordinate placement of anchorage devices with templates for installing signs.

1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Deterioration of **polymer** finishes beyond normal weathering.
 - b. Deterioration of embedded graphic image **colors and sign lamination**
 - 2. Warranty Period: **Five** years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS (as scheduled)

- A. Acrylic Sheet: ASTM D 4802, Category A-1 (cell-cast sheet), Type UVA (UV absorbing) with integral raised characters.
- B. Applied Vinyl: Die-cut characters from vinyl film of nominal thickness of **3 mils (0.076 mm)** with pressure-sensitive adhesive backing, suitable for exterior applications.
- C. Dimensional Character Sign Schedule: (see drawings)

2.2 PANEL SIGNS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. ACE Sign Systems, Inc.
 - 2. Advance Corporation; Braille-Tac Division.
 - 3. Allen Industries Architectural Signage
 - 4. Allenite Signs; Allen Marking Products, Inc.
 - 5. APCO Graphics, Inc.
 - 6. ASI-Modulex, Inc.
 - 7. Best Sign Systems Inc.
 - 8. Bunting Graphics, Inc.
 - 9. Fossil Industries, Inc.
 - 10. Gemini Incorporated.
 - 11. Grimco, Inc.
 - 12. Innerface Sign Systems, Inc.
 - 13. InPro Corporation
 - 14. Matthews International Corporation; Bronze Division.
 - 15. Mills Manufacturing Company.
 - 16. Mohawk Sign Systems.
 - 17. Nelson-Harkins Industries.
 - 18. Seton Identification Products.
 - 19. Signature Signs, Incorporated.
 - 20. Supersine Company (The)
- B. Panel Signs: Provide smooth sign panel surfaces constructed to remain flat under installed conditions within a tolerance of plus or minus **1/16 inch (1.5 mm)** measured diagonally from corner to corner, complying with the following requirements:
 - 1. Acrylic Sheet: **0.060 inch** thick.
 - 2. Edge Condition: **Beveled**.
 - 3. Corner Condition: **Square**.
 - 4. Mounting: **Unframed**.
 - a. Manufacturer's standard anchors for substrates encountered.
 - 5. Color: **As selected by Architect from manufacturer's full range**.
 - 6. Tactile Characters: Characters and Grade 2 Braille raised **1/32 inch (0.8 mm)** above surface with contrasting colors.

2.3 ACCESSORIES (as required)

- A. Anchors and Inserts: Provide nonferrous-metal or hot-dip galvanized anchors and inserts for exterior installations and elsewhere as required for corrosion resistance. Use toothed steel or lead expansion-bolt devices for drilled-in-place anchors. Furnish inserts, as required, to be set into concrete or masonry work.

2.4 FABRICATION

- A. General: Provide manufacturer's standard signs of configurations indicated.
 1. Mill joints to tight, hairline fit. Form joints exposed to weather to exclude water penetration.
 2. Preassemble signs in the shop to greatest extent possible. Disassemble signs only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation, in location not exposed to view after final assembly.
 3. Conceal fasteners if possible; otherwise, locate fasteners where they will be inconspicuous.

2.5 FINISHES, GENERAL

- A. 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.

2.6 ACRYLIC SHEET FINISHES

- A. Colored Coatings for Acrylic Sheet: For copy **and background** colors, provide colored coatings, including inks, dyes, and paints, that are recommended by acrylic manufacturers for optimum adherence to acrylic surface and that are UV and water resistant for **five** years for application intended.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Verify that items, **including anchor inserts**, are sized and located to accommodate signs.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Locate signs and accessories where indicated, using mounting methods of types described and complying with manufacturer's written instructions and per ADA Guidelines.
 - 1. Install signs level, plumb, and at heights indicated, with sign surfaces free of distortion and other defects in appearance.
 - 2. Interior Wall Signs: Install signs on walls adjacent to latch side of door where applicable. Where not indicated or possible, such as double doors, install signs on nearest adjacent walls. Locate to allow approach within 3 inches (75 mm) of sign without encountering protruding objects or standing within swing of door.
- B. Wall-Mounted Signs: Comply with sign manufacturer's written instructions except where more stringent requirements apply.
 - 1. Mechanical Fasteners: Use nonremovable mechanical fasteners placed through predrilled holes. Attach signs with fasteners and anchors suitable for secure attachment to substrate as recommended in writing by sign manufacturer.
 - 2. Signs Mounted on Glass: Provide matching opaque plate on opposite side of glass to conceal mounting materials.

3.3 CLEANING AND PROTECTION

- A. After installation, clean soiled sign surfaces according to manufacturer's written instructions. Protect signs from damage until acceptance by Owner.

3.4 MISCELLANEOUS

- A. All room signs shall be mounted 60 inches above finished floor to centerline of sign. Signs to room shall be mounted adjacent to latch of door per ADA requirements.

3.5 SIGN LOCATION

- A. Provide one (1) interior wall sign for each finish box shown on the floor plan.
- B. Install sign to the right of the handle and per F.B.C. Accessibility Code.

END OF SECTION 10 14 00

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SECTION 10 52 20 - FIRE EXTINGUISHER CABINETS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fire protection cabinets for the following: (size to fit extinguishers)
 - a. Portable fire extinguishers.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for fire protection cabinets.

1. Fire Protection Cabinets: Include roughing-in dimensions, details showing mounting methods, relationships of box and trim to surrounding construction, door hardware, cabinet type, trim style, and panel style.
2. Show location of knockouts for hose valves.

B. Shop Drawings: For fire protection cabinets. Include plans, elevations, sections, details, and attachments to other work.

C. Product Schedule: For fire protection cabinets. Coordinate final fire protection cabinet schedule with fire extinguisher schedule to ensure proper fit and function. Use same designations indicated on Drawings.

D. Maintenance Data: For fire protection cabinets to include in maintenance manuals.

1.3 QUALITY ASSURANCE

A. Fire-Rated, Fire Protection Cabinets: Listed and labeled to comply with requirements in ASTM E 814 for fire-resistance rating of walls where they are installed.

1.4 COORDINATION

- A. Coordinate size of fire protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.
- B. Coordinate sizes and locations of fire protection cabinets with wall depths.

1.5 SEQUENCING

- A. Apply decals and/or vinyl lettering on field-painted, fire protection cabinets after painting is complete.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B.
- B. Tempered Break Glass: ASTM C 1048, Kind FT, Condition A, Type I, Quality q3, 1.5 mm thick.

2.2 FIRE PROTECTION CABINET

- A. Cabinet Type: Suitable for fire extinguisher.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Fire End & Croker Corporation.
 - b. J. L. Industries, Inc., a division of Activar Construction Products Group.
 - c. Kidde Residential and Commercial Division, Subsidiary of Kidde plc.
 - d. Larsen's Manufacturing Company.
 - e. Modern Metal Products, Division of Technico Inc.
 - f. Moon-American.
 - g. Potter Roemer LLC.
 - h. Watrous Division, American Specialties, Inc.
- B. Cabinet Construction:
 - 1. Fire-Rated Cabinets: Where shown in rated walls: construct fire-rated cabinets with double walls fabricated from 0.0428-inch- (1.1-mm-) thick, cold-rolled steel sheet lined with minimum 5/8-inch- (16-mm-) thick, fire-barrier material. Provide factory-drilled mounting holes.

- C. Cabinet Material: Steel sheet.
- D. Semirecessed Cabinet: Stud Walls: Cabinet box partially recessed in walls of sufficient depth to suit style of trim indicated; with one-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (backbend). Provide where walls are of insufficient depth for recessed cabinets but are of sufficient depth to accommodate semirecessed cabinet installation.
 - 1. Square-Edge Trim: 1-1/4- to 1-1/2-inch (32- to 38-mm) backbend depth.
- E. Surface-Mounted Cabinet: Masonry Walls: Cabinet box fully exposed and mounted directly on wall with no trim. Provide where walls are of insufficient depth for semirecessed cabinet installation.
- F. Cabinet Trim Material: Same material and finish as door.
- G. Door Material: Steel sheet.
- H. Door Style: Center glass panel with frame.
- I. Door Glazing: Tempered break glass.
- J. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.
- K. Accessories: (As needed)
 - 1. Mounting Bracket: Manufacturer's standard steel, designed to secure fire extinguisher to fire protection cabinet, of sizes required for types and capacities of fire extinguishers indicated, with plated or baked-enamel finish.
 - 2. Break-Glass Strike: Manufacturer's standard metal strike, complete with chain and mounting clip, secured to cabinet.
 - 3. Lettered Door Handle: One-piece, cast-iron door handle with the word "FIRE" embossed into face.
 - 4. Door Lock: Cam lock that allows door to be opened during emergency by pulling sharply on door handle.
 - 5. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as directed by Architect.
 - a. Identify fire extinguisher in fire protection cabinet with the words "FIRE EXTINGUISHER."
 - 1) Location: Applied to cabinet door.
- L. Finishes:
 - 1. Manufacturer's standard baked-enamel paint for the following:

- a. Exterior of cabinet, door, and trim except for those surfaces indicated to receive another finish.
- b. Interior of cabinet and door.

2.3 FABRICATION

- A. Fire Protection Cabinets: Provide manufacturer's standard box (tub) with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated.
 - 1. Weld joints and grind smooth.
 - 2. Provide factory-drilled mounting holes.
- B. Cabinet Doors: Fabricate doors according to manufacturer's standards, from materials indicated and coordinated with cabinet types and trim styles selected.
 - 1. Fabricate door frames with tubular stiles and rails and hollow-metal design, minimum 1/2 inch (13 mm) thick.
 - 2. Fabricate door frames of one-piece construction with edges flanged.
 - 3. Miter and weld perimeter door frames.
- C. Cabinet Trim: Fabricate cabinet trim in one piece with corners mitered, welded, and ground smooth.

2.4 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces of fire protection cabinets from damage by applying a strippable, temporary protective covering before shipping.
- C. Finish fire protection cabinets after assembly.
- D. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.5 STEEL FINISHES

- A. Surface Preparation: Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning" or SSPC-SP 8, "Pickling". After cleaning, apply a conversion coating suited to the organic coating to be applied over it.
- B. Factory Prime Finish: Apply manufacturer's standard, fast-curing, lead- and chromate-free, universal primer immediately after surface preparation and pretreatment.

- C. Baked-Enamel or Powder-Coat Finish: Immediately after cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of 2 mils (0.05 mm).
 - 1. Color and Gloss: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine walls and partitions for suitable framing depth and blocking where recessed or semirecessed cabinets will be installed.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare recesses for semirecessed fire protection cabinets as required by type and size of cabinet and trim style.

3.3 INSTALLATION

- A. General: Install fire protection cabinets in locations and at mounting heights indicated or, if not indicated, at heights indicated below:
 - 1. Fire Protection Cabinets: 54 inches (1372 mm) above finished floor to top of cabinet.
- B. Fire Protection Cabinets: Fasten cabinets to structure, square and plumb.
 - 1. Unless otherwise indicated, provide recessed fire protection cabinets. If wall thickness is not adequate for recessed cabinets, provide semirecessed fire protection cabinets.
 - 2. Provide inside latch and lock for break-glass panels.
 - 3. Fasten mounting brackets to inside surface of fire protection cabinets, square and plumb.
- C. Identification: Apply vinyl lettering at locations indicated.

3.4 ADJUSTING AND CLEANING

- A. Remove temporary protective coverings and strippable films, if any, as fire protection cabinets are installed unless otherwise indicated in manufacturer's written installation instructions.
- B. Adjust fire protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.
- C. On completion of fire protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.
- D. Touch up marred finishes, or replace fire protection cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by fire protection cabinet and mounting bracket manufacturers.
- E. Replace fire protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 10 52 20

**FLORIDA A&M UNIVERSITY
RATTLER POINT WASH HOUSE BUILD-OUT
CONSTRUCTION DOCUMENTS
SEPTEMBER 13, 2024**

SECTION 10 52 30 - FIRE EXTINGUISHERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes portable, fire extinguishers and mounting brackets for fire extinguishers.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated. Include rating and classification, material descriptions, dimensions of individual components and profiles, and finishes for fire extinguisher and mounting brackets.
- B. Product Schedule: For fire extinguishers. Coordinate final fire extinguisher schedule with fire protection cabinet schedule to ensure proper fit and function. Use same designations indicated on Drawings.
- C. Operation and Maintenance Data: For fire extinguishers to include in maintenance manuals.
- D. Warranty: Sample of special warranty.

1.3 QUALITY ASSURANCE

- A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."
- B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.
 - 1. Provide fire extinguishers approved, listed, and labeled by FMG.

1.4 COORDINATION

- A. Coordinate type and capacity of fire extinguishers with fire protection cabinets to ensure fit and function.

1.5 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Failure of hydrostatic test according to NFPA 10.
 - b. Faulty operation of valves or release levers.
 - 2. Warranty Period: Six years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

- A. Fire Extinguishers: Type, size, and capacity for each mounting brackets mechanical/electrical roomsfire protection cabinet and mounting bracket (all others).
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Amerex Corporation.
 - b. Ansul Incorporated; Tyco International Ltd.
 - c. Badger Fire Protection; a Kidde company.
 - d. Buckeye Fire Equipment Company.
 - e. Fire End & Croker Corporation.
 - f. J. L. Industries, Inc.; a division of Activar Construction Products Group.
 - g. Kidde Residential and Commercial Division; Subsidiary of Kidde plc.
 - h. Larsen's Manufacturing Company.
 - i. Moon-American.
 - j. Pem All Fire Extinguisher Corp.; a division of PEM Systems, Inc.
 - k. Potter Roemer LLC.
 - l. Pyro-Chem; Tyco Safety Products.
 - 2. Valves: Manufacturer's standard.
 - 3. Handles and Levers: Manufacturer's standard.
 - 4. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B and bar coding for documenting fire extinguisher location, inspections, maintenance, and recharging.
- B. Multipurpose Dry-Chemical Type in Steel Container: UL-rated 4-A:60-B:C, 10-lb (4.5-kg) nominal capacity, with monoammonium phosphate-based dry chemical in enameled-steel container.

2.2 MOUNTING BRACKETS

- A. Mounting Brackets: Manufacturer's standard galvanized steel, designed to secure fire extinguisher to wall or structure, of sizes required for types and capacities of fire extinguishers indicated, with plated or red baked-enamel finish.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Amerex Corporation.
 - b. Ansul Incorporated; Tyco International Ltd.
 - c. Badger Fire Protection; a Kidde company.
 - d. Buckeye Fire Equipment Company.
 - e. Fire End & Croker Corporation.
 - f. J. L. Industries, Inc.; a division of Activar Construction Products Group.
 - g. Larsen's Manufacturing Company.
 - h. Potter Roemer LLC.
- B. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated by Architect.
 - 1. Identify bracket-mounted fire extinguishers with the words "FIRE EXTINGUISHER" in red letter decals applied to mounting surface.
 - a. Orientation: Vertical.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine fire extinguishers for proper charging and tagging.
 - 1. Remove and replace damaged, defective, or undercharged fire extinguishers.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install fire extinguishers and mounting brackets in locations indicated and in compliance with requirements of authorities having jurisdiction.
 - 1. Mounting Brackets: 54 inches (1372 mm) above finished floor to top of fire extinguisher.

- B. Mounting Brackets: Fasten mounting brackets to surfaces, square and plumb, at locations indicated.

END OF SECTION 10 52 30

**FLORIDA A&M UNIVERSITY
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SEPTEMBER 13, 2024**

SECTION 12 21 13 - HORIZONTAL LOUVER BLINDS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Horizontal louver blinds with polymer slats.

1.2 SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified, 12-inches long.
- C. Samples for Initial Selection: For each type and color of horizontal louver blind.
 - 1. Include Samples of accessories involving color selection.
- D. Product Schedule: For horizontal louver blinds.

1.3 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For horizontal louver blinds to include in maintenance manuals.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Horizontal Louver Blinds: Full-size units equal to 5 percent of quantity installed for each size, color, texture, pattern, and gloss indicated, but no fewer than two units.

1.5 QUALITY ASSURANCE

- A. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
 - 1. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver horizontal louver blinds in factory packages, marked with manufacturer, product name, and location of installation using same designations indicated on Drawings.

1.7 FIELD CONDITIONS

- A. Environmental Limitations: Do not install horizontal louver blinds until construction and wet-work and finish work in spaces, including painting, is complete and dry and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Field Measurements: Where horizontal louver blinds 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 operating hardware of operable glazed units through entire operating range. Notify Architect of installation conditions that vary from Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain horizontal louver blinds from single source from single manufacturer.

2.2 HORIZONTAL LOUVER BLINDS, POLYMER SLATS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. SWF Contract (Basis of Design: Lake Forest Premium Faux Wood Blinds – 2” Wood Grain)
 2. Levolor
 3. Bali
 4. Bella View
- B. Flame-Resistance Rating: Comply with NFPA 701; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- C. Slats: Polymers that are lead free, UV stabilized, integrally colored, opaque, and will not crack or yellow; antistatic, dust-repellent treated.
1. Formulation: Permanently flexible, extruded PVC.
 2. Width: 2 inches.
 3. Thickness: 0.105-inch minimum.
 4. Spacing: Manufacturer's standard.
 5. Profile: Manufacturer's standard.
 6. Features:
 - a. Lift-Cord Rout Holes: None.
- D. Headrail: 1 5/8” x 2 1/4” x 0.22” extruded steel with 1/8” light blocking lip on bottom center line. Headrail fully encloses operating mechanisms on three sides and ends.
1. Capacity: One blind(s) per headrail unless otherwise indicated.
 2. Manual Lift Mechanism:
 - a. Lift-Cord Lock: Variable; stops lift cord at user-selected position within full operating range.
 - b. Operator: Extension of lift cord(s) through lift-cord lock mechanism to form cord pull.
 3. Manual Tilt Mechanism: Enclosed worm-gear mechanism and linkage rod that adjusts ladders.
 - a. Tilt: Full.
 - b. Tilt: Two-direction.
 - c. Operator: Dual cord.
 - d. Over-Rotation Protection: Manufacturer's detachable operator or slip clutch to prevent over rotation of gear.
 4. Manual Lift-Operator and Tilt-Operator Lengths: Length required to extend to 48-inches above floor level when blind is fully closed.
 5. Manual Lift-Operator and Tilt-Operator Locations: Right side and left side of headrail, respectively, unless otherwise indicated.
- E. Bottom Rail: Secures and protects ends of ladders and lift cords.

1. Type: Trapezoid-shaped bottom angled for minimizing light gaps.
- F. Lift Cord: Manufacturer's standard braided cord.
- G. Ladders: Evenly spaced across headrail at spacing that prevents long-term slat sag.
1. Type: Cloth tape, manufacturer's standard width.
- H. Valance: Manufacturer's standard.
- I. Mounting Brackets: With spacers and shims required for blind placement and alignment indicated.
1. Type: End.
 2. Intermediate Support: Provide intermediate support brackets to produce support spacing recommended by blind manufacturer for weight and size of blind.
- J. Hold-Down Brackets and Hooks or Pins: Manufacturer's standard.
- K. Colors, Textures, Patterns, and Gloss:
1. Slats: As selected by Architect from manufacturer's full range.
 2. Components: Provide rails, cords, ladders, and materials exposed to view matching or coordinating with slat color unless otherwise indicated.

2.3 HORIZONTAL LOUVER BLIND FABRICATION

- A. Product Safety Standard: Fabricate horizontal louver blinds to comply with WCMA A 100.1 including requirements for corded, flexible, looped devices; lead content of components; and warning labels.
- B. Unit Sizes: Fabricate units in sizes to fill window and other openings as follows, measured at 74 deg. F:
1. Between (Inside) Jamb Installation: Width equal to jamb-to-jamb dimension of opening in which blind is installed less 1/4-inch per side or 1/2-inch total, plus or minus 1/8-inch. Length equal to head-to-sill dimension of opening in which blind is installed less 1/4-inch, plus or minus 1/8-inch.
- C. Concealed Components: Noncorrodible or corrosion-resistant-coated materials.
1. Lift-and-Tilt Mechanisms: With permanently lubricated moving parts.
- D. Mounting and Intermediate Brackets: Designed for removal and reinstallation of blind without damaging blind and adjacent surfaces, for supporting blind components, and for bracket positions and blind placement indicated.

- E. Installation Fasteners: No fewer than two fasteners per bracket, fabricated from metal noncorrosive to brackets and adjoining construction; type designed for securing to supporting substrate; and supporting blinds and accessories under conditions of normal use.
- F. Color-Coated Finish:
 - 1. Metal: For 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.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. 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.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install horizontal louver blinds level and plumb, aligned and centered on openings, and aligned with adjacent units according to manufacturer's written instructions.
 - 1. Install mounting and intermediate brackets to prevent deflection of headrails.
 - 2. Install with clearances that prevent interference with adjacent blinds, adjacent construction, and operating hardware of glazed openings, other window treatments, and similar building components and furnishings.

3.3 ADJUSTING

- A. Adjust horizontal louver blinds to operate free of binding or malfunction through full operating ranges.

3.4 CLEANING AND PROTECTION

- A. Clean horizontal louver blind 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 ensures that horizontal louver blinds are without damage or deterioration at time of Substantial Completion.

- C. Replace damaged horizontal louver blinds that cannot be repaired in a manner approved by Architect before time of Substantial Completion.

3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain systems.

END OF SECTION 12 21 13