Specifications
for the
F-35: CONVERT BLDG 1407 FOR AGE

187th Fighter Wing Dannelly Field - AL ANG
Montgomery, AL

S|S|&|L

ARCHITECTURE & INTERIOR DESIGN
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VOLUME I

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SECTION 000102 - PROJECT INFORMATION AND SUMMARY

PART 1 GENERAL

1.01 PROJECT IDENTIFICATION

A. Project Name: F-35: Convert Building 1407 for AGE Facility, located at 187th Fighter Wing, Air National Guard (ANG) Base at Dannelly Field, Montgomery, AL.

B. Government Project Number: FAKZ182357

C. Architect's Project Number: 18074

D. The Owner, hereinafter referred to as the Government: Alabama Air National Guard.

E. Owner's Representatives:

1. Contracting Officer: Mr. Craig Kast
2. Contracting Specialist: Mr. Stephen Shanks
3. Contracting Officer Representative: Major Adam Sanders, Base Civil Engineer
4. Alternate Contracting Officer Representative: Major William Sanford, Deputy Base Civil Engineer

1.02 CONTRACT DURATION

A. 395 calendar days from notice to proceed to Beneficial Occupancy. The listed duration shall include completion of all punch list activities identified at the project final inspection. The Government intends to occupy the building upon Beneficial Occupancy.

1.03 PROJECT DESCRIPTION

A. Project scope includes structural, architectural, plumbing, mechanical, electrical and relocation of existing utilities for complete renovation of the existing facility (Building 1407) and associated sitework per the contract documents. The proposed project includes, but is not limited to the following:

1. Existing high-bay maintenance area will remain a maintenance area. The building plumbing, electrical, and mechanical systems will be modified and extended as required to support the new Air Ground Equipment (AGE) function intended to be housed in the renovated facility.

2. A portion of the existing office area will be reconfigured to provide ADA compliance and facilitate the needs of AGE maintenance associated with F-35 airframe.

3. Other portions of the existing office and ancillary work areas will remain in their current configuration and receive finish upgrade.

4. Existing HVAC, lighting, and electrical systems will be removed and replaced with, energy efficient systems.

5. A new UFC 3-600-01 compliant fire suppression system and new fire alarm/mass notification system will be provided.

6. Existing roof covering will remain. A new single ply roof membrane system installation is included as a bid option.

7. The existing structural systems consist of a structural steel roof framing system supported by a combination of load bearing CMU walls and structural steel framing. The slab is a ground supported floor slab. Major bearing components are supported on drilled piers where required based upon allowable soil loading. The existing structural systems will remain with only minor modifications to support new wall configurations and new openings in existing load bearing interior and exterior wall assemblies.

8. Sitework will include, but is not limited to, the following:

   a. Installation of new domestic water and fire water service.

   b. Installation of new electrical and telecommunications service.

   c. Cement concrete pavement patching and repair as required to support new utilities.

   d. Installation of a new underground oil/water separator system.

   e. Concrete pavement removal and replacement as required to install new wash rack with slope/elevations indicated on the drawings (Bid Option)

B. Antiterrorism and Building Standoff Requirements:

1. The project site and building structural, architectural, electrical and mechanical systems have been designed to meet the prescribed levels of protection against terrorist attacks in accordance with the Department of Defense (DoD) Unified Facilities Criteria (UFC) 4-010-01 DoD Minimum Antiterrorism Standards for Buildings.

C. Sustainability Design and Energy Conservation:

1. The project design incorporates Sustainability Concepts to achieve optimum resource efficiency, constructability, sustainability, and energy conservation.

2. This project has been registered with the USGBCI for guiding principles assessment recognition process.

3. The Contractor is responsible for ensuring all specified sustainable and energy conservation goals are achieved and fully implemented. Refer to section 01 3329 for sustainability reporting requirements. Refer to technical specifications for specific product requirements.

D. Building Systems Commissioning:

1. Refer to specification section 01 9100.015 - Total Building Commissioning, and other individual specifications sections for Contractor's responsibilities related to Building Systems Commissioning.

E. Government Furnished Furniture, furnishings and Equipment (FF&E):

1. Contractor's base bid shall include rough-ins for plumbing, mechanical, and electrical; including installation and final connection of all items indicated on the drawings as Government Furnished Contractor Installed (GFCI).

F. Contractor's Qualified Fire Protection Engineer (QFPE) Services:

1. The Contractor shall employ a Qualified Fire Protection Engineer (QFPE) meeting the requirements of UFC 3-600-01.

2. The QFPE shall review, sign, and certify all fire protection and life safety systems including; but, not limited to fire alarm, mass notification, and sprinkler systems included within the proposed project.

3. All shop drawing / calculations / material submittals for applicable life safety systems must be reviewed and stamped by the Contractor' QFPE in accordance with section 9-6.3 of UFC 3-600-01.

4. Waterflow testing shall be performed under the direction of the Contractor's QFPE in accordance with section 9-6.4 of UFC 3-600-01. Waterflow testing shall be performed by the Contractor in order to develop required hydraulic calculations. Use of waterflow testing performed by the Architect during design cannot be utilized by the Contractor for preparation of project submittals.

5. During Construction the Contractor's QFPE must visit the site in intervals/quantities required to certify that the system has been installed in accordance with the project requirements. At a minimum, the QFPE shall attend/witness the above ceiling inspection and attend/witness final acceptance testing for all fire protection and life safety systems. Additional site inspections are at the discretion of the Contractor's QFPE. The Contractor's QFPE shall certify, in writing, that the system has been installed in accordance with project requirements. The Contractor's QFPR certification shall be in writing, on company letterhead, and include the QFPE's registration stamp.

1.04 PERMITS, FEES AND NOTICES

A. Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit and other permits and governmental fees, licenses, and inspections necessary for proper execution and completion of the Work which are customarily secured after award of the Construction Contract and which are in effect on the date of receipt of bids.

   1. City of Montgomery Building Permit will not be required.

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

1.05 USE OF SITE AND MISC. REQUIREMENTS

A. The space available to the contractor for the performance of the work, either exclusively or in conjunction with others performing other construction as part of the project, is as per the Government's approval.

   1. Other areas are off limits to all construction personnel.

B. Access to site will be limited; obtain Government's approval of proposed routes of access.

C. Keep existing sidewalks, roads, parking lots and drives on site clear and available at all times. Promptly remove mud, dirt, debris, etc. from sidewalks, streets, and public right-of-way during construction as it occurs.

D. Storage areas on site are very minimal and will be limited to materials that are to be immediately used in the progress of the work. If additional storage is required, then Contractor shall secure and be responsible to pay for such off site storage in a fully bonded and insured facility acceptable to the Government, with all items clearly identified as being assigned to this project.

1. Contractor will be limited to the areas included within the project limits shown on the civil drawings.

E. Provide secure temporary barricades, fencing, etc. as required to separate the public from construction operations. Compliant safety and/or warning signage is to be provided as well in conjunction with fencing and barricades.

1. Site safety and security is the General Contractor's responsibility. Fencing shall be provided as deemed necessary to protect the site from theft and damage and to prevent access to the site by the public. A fence along the project limits is anticipated at a minimum. However, exact location/extents of fencing is at the discretion of the Contractor.

F. Construction operations are not to affect any of the ongoing operations throughout the site and/or adjacent sites. Construction equipment is not to be attached to, or swing over existing buildings to remain, public areas, occupied buildings or parking lots, right-of-ways, etc.

G. Comply with the Government's security requirements - refer to specification section 01 3553.

H. The contractor shall provide all testing, inspections, and similar services; these services also include those specified to be performed by an independent agency.

1.06 UTILITY OUTAGES AND SHUTDOWN

A. All electrical and communication shut downs shall be performed on a non-working day for the Government (Saturday, Sunday, Monday, or Holidays) unless specifically approved by the base Contracting Officer Representative.

B. Limit shutdown of utility services to 8 hours at a time, arranged at least 72 hours in advance with the Government.

C. Prevent accidental disruption of utility services to other facilities.

1.07 PHASING OF WORK

A. The work of this project shall be completed in one phase. However, the Contractor shall coordinate the work as required to ensure all existing roadways and facilities adjacent to the project site remain open and accessible for use by the Government.

1.08 WORK SEQUENCE

A. Coordinate construction schedule and operations with Contracting Officer Representative.

B. The contractor shall be responsible for all means, methods, sequencing of work, demolition, and reparations to the property and facilities as required to accomplish the work. This shall include but is not limited to the installation of all equipment furnishings, and materials.

1.09 PROJECT CONSULTANTS

A. The Architect, hereinafter referred to as Architect: Seay Seay & Litchfield P.C..

1. Address: 1115 South Court Street.
2. City, State, Zip: Montgomery AL 36104.
3. Phone/Fax: 334-263-5162 334-263-5170.
4. Project Manager: Jake Johnson, AIA
5. Prinicipals-in-Charge: Wes R. Osmer, AIA, LEED AP

B. Architect's Consultants:

1. Civil Engineering:
   a. Professional Engineering Consultants
   b. Address: 822 South McDonough St..
   c. City, State, Zip: Montgomery, AL, 36104.
   d. Phone/Fax: 334-262-7307 / 334-262-7309.
   e. Contact: Steve Green - Pat Moseley
2. Structural Engineering:
   a. Grant Engineering
   b. Phone/Fax: 334-546-8818
   c. Contact: Terry Grant
3. Plumbing, Mechanical & Fire Suppression Engineering:
   a. Peterson Engineering
   b. Address: 75 South F Street
   c. City, State, Zip: Pensacola, FL 32502

d. Phone: 850-434-0513

e. Contact: Steve Johnson, P.E.

4. Electrical Engineering:

a. Garner & Associates

b. Address: 903 South Perry Street

c. City, State, Zip: Montgomery, AL 36104

d. Phone: 334-269-0329

e. Contact: Morgan Garner, P.E.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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SECTION 010450 - CUTTING AND PATCHING

1. GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including Requirements of the Government's Solicitation and other Division-1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section specifies administrative and procedural requirements for cutting and patching.

B. Refer to other Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

1. Requirements of this Section apply to mechanical and electrical installations. Refer to Divisions 21, 22, 23, 26, 27, & 28 Sections for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.

1.03 SUBMITTALS

A. Cutting and Patching Proposal: Where approval of procedures and/or phasing for cutting and patching is required before proceeding, submit a proposal describing procedures well in advance of the time cutting and patching will be performed and request approval to proceed. Include the following information, as applicable, in the proposal:

B. Describe the extent of cutting and patching required and how it is to be performed; indicate why it cannot be avoided.

C. Describe anticipated results in terms of changes to existing construction; include changes to structural elements and operating components as well as changes in the building's appearance and other significant visual elements.

D. List products to be used and firms or entities that will perform Work.

E. Indicate dates when cutting and patching is to be performed.

F. List utilities that will be disturbed or affected, including those that will be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.

G. Where cutting and patching involves addition of reinforcement to structural elements, submit details and engineering calculations to show how reinforcement is integrated with the original structure.

H. Approval by the Contracting Officer to proceed with cutting and patching does not waive the Contracting Officer's right to later require complete removal and replacement of a part of the Work found to be unsatisfactory.

1.04 QUALITY ASSURANCE

A. Requirements for Structural Work: Do not cut and patch structural elements in a manner that would reduce their load-carrying capacity or load-deflection ratio.

B. Obtain approval of the cutting and patching proposal before cutting and patching the following structural elements:

1. Foundation construction.
2. Bearing and retaining walls.
3. Structural concrete.
4. Structural steel.
5. Lintels.
6. Timber and primary wood framing.
7. Structural decking.
8. Stair systems.
9. Miscellaneous structural metals.
10. Exterior curtain wall construction.
11. Equipment supports.
12. Piping, ductwork, vessels and equipment.
13. Structural systems of special construction in Division-13.

C. Operational and Safety Limitations: Do not cut and patch operating elements or safety related components in a manner that would result in reducing their capacity to perform as intended, or result in increased maintenance, or decreased operational life or safety.

1. Obtain approval of the cutting and patching proposal before cutting and patching the following operating elements or safety related systems:

    a. Primary operational systems and equipment.

    b. Membranes and flashings.

    c. Fire protection systems.

    d. Communication systems.

    e. Electrical wiring systems.

PART 2 PRODUCTS

2.01 MATERIALS

A. Use materials that are identical to existing materials. If identical materials are not available or cannot be used where exposed surfaces are involved, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect. Use materials whose installed performance will equal or surpass that of existing materials.

PART 3 EXECUTION

3.01 INSPECTION

A. Before cutting existing surfaces, examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed. Take corrective action before proceeding, if unsafe or unsatisfactory conditions are encountered.

1. Before proceeding, meet at the site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

3.02 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.

C. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

D. Take all precautions necessary to avoid cutting existing pipe, conduit or ductwork serving the building, but scheduled to be removed or relocated until provisions have been made to bypass them.

3.03 PERFORMANCE

A. General: Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.

1. Cut existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.

B. Cutting: Cut existing construction using methods least likely to damage elements to be retained or adjoining construction. Where possible review proposed procedures with the original installer; comply with the original installer's recommendations.

1. In general, where cutting is required use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots neatly to size required with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

2. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.

3. Cut through concrete and masonry using a cutting machine such as a carborundum saw or diamond core drill.

4. Comply with requirements of applicable Sections of Division-2 where cutting and patching requires excavating and backfilling.

5. By-pass utility services such as pipe or conduit, before cutting, where services are shown or required to be removed, relocated or abandoned. Cut-off pipe or conduit in walls or partitions to be removed. Cap, valve or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.

C. Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.

1. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.

2. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

3. Where removal of walls or partitions extends one finished area into another, patch and repair floor and wall surfaces in the new space to provide an even surface of uniform color and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary to achieve uniform color and appearance.

    a. Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken containing the patch, after the patched area has received primer and second coat.

4. Patch, repair or rehang existing ceilings as necessary to provide an even plane surface of uniform appearance.

3.04 CLEANING

A. Thoroughly clean areas and spaces where cutting and patching is performed or used as access. Remove completely paint, mortar, oils, putty and items of similar nature. Thoroughly clean piping, conduit and similar features before painting or other finishing is applied. Restore damaged pipe covering to its original condition.

END OF SECTION

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SECTION 010500 - FIELD ENGINEERING

1. GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Requirements of the Government's Solicitation and other Division-1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. General: This Section specifies administrative and procedural requirements for field engineering services, including, but not necessarily limited to, the following:

1. Land Survey Work.

1.03 SUBMITTALS

A. Certificates: Submit a certificate signed by the Land Surveyor or Professional Engineer certifying that the location and elevation of improvements comply with the Contract Documents.

B. Project Record Documents: Submit a record of Work performed and record survey data as required under provisions of Sections "Submittals" and "Project Closeout".

1.04 QUALITY ASSURANCE

A. Surveyor: Engage a Registered Land Surveyor registered in the State where the project is located, to perform land surveying services required.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.01 EXAMINATION

A. The Government will identify existing control points and property line corner stakes.

B. Verify layout information shown on the Drawings, in relation to the property survey and existing benchmarks before proceeding to layout the Work. Locate and protect existing benchmarks and control points. Preserve permanent reference points during construction.

1. Do not change or relocate benchmarks or control points without prior written approval. Promptly report lost or destroyed reference points, or requirements to

relocate reference points because of necessary changes in grades or locations.

2. Promptly replace lost or destroyed project control points. Base replacements on the original survey control points.

C. Establish and maintain a minimum of one permanent benchmark on the site, referenced to data established by survey control points.

1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.

D. Existing utilities and equipment: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction.

1. Prior to construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer and water service piping.

2. The Government requires a dig permit to be submitted for and approved prior to drilling or digging that might impact underground utilities. Coordinate with Contracting Officer Representative in advance of activities requiring an approved dig permit. Submit permit application to Base Civil Engineering a minimum of one week prior to scheduled start of activities requiring a dig permit.

3.02 PERFORMANCE

A. Working from lines and levels established by the property survey, establish benchmarks and markers to set lines and levels at each story of construction and elsewhere as needed to properly locate each element of the Project. Calculate and measure required dimensions within indicated or recognized tolerances. Do not scale Drawings to determine dimensions.

1. Advise entities engaged in construction activities, of marked lines and levels provided for their use.

2. As construction proceeds, check every major element for line, level and plumb.

B. Surveyor's Log: Maintain a surveyor's log of control and other survey Work. Make this log available for reference.

1. Record deviations from required lines and levels, and advise the Contracting Officer when deviations that exceed indicated or recognized tolerances are detected. On Project Record Drawings, record deviations that are accepted and not

corrected.

C. Site Improvements: Locate and lay out site improvements, including pavements, stakes for grading, fill and topsoil placement, utility slopes and invert elevations by instrumentation and similar appropriate means.

D. Building Lines and Levels: Locate and lay out batter boards for structures, building foundations, column grids and locations, floor levels and control lines and levels required for mechanical and electrical Work.

E. Existing Utilities: Verify locations of all utilities prior to commencing. Furnish information necessary to adjust, move or relocate existing structures, utility poles, lines, services or other appurtenances located in, or affected by construction. Coordinate with local authorities having jurisdiction with construction.

END OF SECTION

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SECTION 012000 - PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedures for preparation and submittal of applications for progress payments.

B. Documentation of changes in Contract Price and Contract Time.

C. Procedures for preparation and submittal of application for final payment.

1.02 RELATED REQUIREMENTS

1.03 SCHEDULE OF VALUES

A. Form to be used: Government's Approved Form.

B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to the Government for approval.

C. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification section. Identify site mobilization, bonds and insurance, and material versus labor costs .

1. Provide separate line items for material and labor for each item of work.

2. Provide separate line items for each direct general contractor's cost for general conditions including:

   a. Bonds

   b. Insurance

   c. Superintendent

   d. Quality Control Representative

   e. On Site Office Cost including rent (if applicable), utilities and supplies.

3. Break larger items of work down into line items not exceeding $50,000 in value unless specifically approved by the Government.

4. Provide separate schedule of values for each facility included within the project scope.

D. Revise schedule to list approved Change Orders, with each Application For Payment.

1. Change Orders should be listed as separate line items included at the end of the schedule of values.

2. When a Change Order includes multiple items of work, each item of work shall be listed as a separate line item with the approximate percentage complete for each scope of work listed.

E. Submit schedule of values within the timeframe outlined in the General Conditions of the Contract for Construction.

1.04 APPLICATIONS FOR PROGRESS PAYMENTS

A. Comply with all requirements of the General Conditions of the Contract for Construction. Additional requirements/explanations are listed below.

B. Use Government's Approved Form.

C. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to the Government for approval.

D. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.

1. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of work.

E. Include the following with the application:

1. Transmittal letter as specified for submittals in Section 013000.

2. Construction progress schedule, revised and current as specified in Section 013000.

3. Current construction photographs specified in Section 013000.

1.05 STORED MATERIALS:

A. Off-site stored materials must be authorized for consideration in the awarded contract and be approved by the Contracting Officer if the Contactor anticipates requesting payment for off-site stored materials prior to the materials being delivered to the project site and and/or placed into operation/construction.

B. The following will be required prior to approval of payment for off-site stored materials:

1. Bill of lading for materials.

2. Documentation that the materials have been titled to the Contractor and will be used exclusively in the performance of the Contract.

3. Evidence of insurance for the facility storing the materials reflecting 100% total replacement value coverage.

4. Photographs of the materials being stored.

C. The Contracting Officer must verify and approve of off-site stored materials prior to approval of payment. Approval of off-site storage (item A above) will not guarantee approval of payment for off-site stored materials. Payment of off-site stored materials will be at the discretion of the Contracting Officer pending verification of the materials being stored and review of required documentation (item B above) offered by the Contractor with the application for payment.

1.06 MODIFICATION PROCEDURES

A. Comply with all requirements of the General Conditions of the Contractor for Construction.

B. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.

1.07 APPLICATION FOR FINAL PAYMENT

A. Comply with all requirements of the General Conditions of the Contractor for Construction.

B. Application for Final Payment will not be considered until the following have been accomplished:

1. All closeout procedures specified in Section 017000.

2. All stipulated requirements stated in the General Conditions of the Contract for Construction. .

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

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SECTION 012300 - BID OPTIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Description of Bid Options.

B. Procedures for pricing Bid Options.

1.02 ACCEPTANCE OF Bid Options

A. Bid Options quoted on Bid Forms will be reviewed and accepted or rejected at the Government's option in accordance with the requirements of the Contract Documents. Accepted Bid Options will be identified in the Construction Contract.

B. Coordinate related work and modify surrounding work to integrate the Work of each Bid Option.

1.03 SUMMARY

A. Definition: A Bid Option is an amount proposed by Bidders and stated on the Bid Form for certain construction activities defined in the Bidding Requirements that may be added to the Base Bid amount if the the Government decides to accept a corresponding change in either the amount of construction to be completed, or in the products, materials, equipment, systems or installation methods described in Contract Documents. The Base Bid is all items shown on the the Contract Documents except items to be added back by below schedule of Bid Options.

B. Coordination: Coordinate related Work and modify or adjust adjacent Work as necessary to ensure that Work affected by each accepted Bid Option is complete and fully integrated into the project.

C. Schedule: A "Schedule of Bid Options" is included at the end of this Section. Specification Sections referenced in the Schedule contain requirements for materials and methods necessary to achieve the Work described under each Bid Option.

D. Include as part of each Bid Option, miscellaneous devices, accessory objects and similar items incidental to or required for a complete installation whether or not mentioned as part of the Bid Option.

1.04 SCHEDULE OF Bid Options

A. **Bid Option Item No. 1 (Additive): Wash Rack**

1. This Bid Option shall include all plant, labor, and material for the following scope of work:

    a. Remove and replace existing concrete pavement on the East side of the facility with the elevations/slopes indicated as required to create a new exterior wash rack for washing of AGE equipment.

    b. Installation of new catch basin at the wash rack location and installation of new sub-grade piping required to connect the catch basin to the new oil/water separator indicated on the drawings.

    c. If this Bid Option is not awarded, the existing cement concrete paving in the wash rack area will remain without change. No catch basin, underground piping, or overhead protection will be required. The oil/water separator indicated on the civil drawings shall be included within the scope of the base bid.

B. **Bid Option Item No. 2 (Additive): Recover Roof:**

1. This Bid Option shall include all plant, labor, and material for the following scope of work:

    a. Installation of a new thermoplastic membrane roofing system as indicated on the drawings and specified in section 07 5400 over the entire facility.

    b. If this Bid Option is awarded, the existing roof membrane shall remain in place. New cover board and new thermoplastic membrane roofing system will be applied over the new coverboard/existing roof assembly as indicated on the drawings. Removal of the existing roofing assembly is not required as a part of this Bid Option.

    c. Also included within the scope of this bid option is removal of the existing lightning protection system and installation of a new UFC 3-575-01 compliant lighting protection system as indicated on the drawings. Bid Option shall include all testing and certification required by UFC 3-575-01, AFI 32-0165, and NFPA 780.

    d. If this Bid Option is not awarded, the existing roofing systems and lightning protection systems shall remain without change. Contractor shall include in the base bid any patching and repairing of existing roofing systems that is required to coordinate with new roof penetrations and roof mounted equipment indicated on the drawings

C. **Bid Option No. 3 (Additive): Epoxy Floor System:**

1. This Bid Option shall include all plant, labor, and material required for the installation of high performance floor coatings in General Purpose Equipment and Repair Bay and Tool Room, Rooms 129 and 130, in accordance with specification section 09 9600 - High Performance Coatings.

2. If this Option is not awarded, the Base Bid shall include installation of Sealed Concrete Finish as specified in Section 09 9000 in these spaces.

D. **Bid Option Item No. 4 (Additive): Replace Exterior Roll Up Doors:**

1. This Bid Option shall include all plant, labor, and material for the following scope of work:

   a. Removal and replacement of existing exterior roll up doors with new electrically operated and insulated coiling overhead doors as indicated on the drawings and specified in specification section 08 3323. Design intent is that the existing hollow metal frames at each existing opening shall remain. Contractor shall include all cost associated with removing existing overhead coiling door channel frame from existing frame to remain. Existing frame to remain shall be patched, ground smooth, and painted. If required for successful installation of new overhead coiling door assemblies, the Contractor shall include the cost to remove and replace the existing hollow metal frames within this Bid Option.

   b. If this Bid Option is not awarded, the existing overhead coiling doors will remain. Contractor shall include, as part of the base bid, all cost to scrape, sand, and re-paint existing coiling doors and frames intended to remain.

   c. The Contractor shall also include in the base bid the cost to install new overhead door assembly in room 107 as indicated on the drawings.

E. **Bid Option No. 5 (Additive): Bathroom Tile:**

1. This Bid Option shall include all plant, labor, and material for the following scope of work :

   a. Installation of hard tile floor finishes in rooms 112 and 113 in lieu of sealed concrete flooring as indicated on the drawings.

   b. Increased extent of hard tile wall applications in rooms 112 and 113 as indicated on drawing sheets A6.1, A6.2, and A6.3.

   c. If the bid option is awarded, hard tile shall be installed in accordance with specification section 09 3000.

d. If the bid option is not awarded, the base bid shall consist of sealed concrete flooring and painted CMU walls in rooms 112 and 113. Base bid shall include hard tile at shower applications as indicated n drawing sheets A6.1, A6.2, and A6.3.

F. **Bid Option No. 6 (Additive): Telecommunications Systems Structured Cabling**

1. This Bid Option shall include all plant, labor, and material for the following scope of work:

   a. Provide and install new telecommunications systems wiring, devices, equipment, etc... as indicated on the drawings and specified in Division 27.

   b. If this Bid Option is not awarded, Contractor to provide, within the base bid, all raceway, cable tray, sleeves, etc... required telecommunications system wiring. If the Bid Option is not awarded, installation of all cabling, outlet devices, racks, equipment, etc... indicated by the drawings will be provided by the Government following beneficial occupancy.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 013000 - ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preconstruction meeting.

B. Progress meetings.

C. Construction progress schedule.

D. Progress photographs.

E. Coordination drawings.

1.02 RELATED REQUIREMENTS

A. Section 01 7000 - Execution and Closeout Requirements

B. Section 01 7800 - Closeout Submittals

1.03 CONTRACTOR'S PROJECT ADMINISTRATION REQUIREMENTS

A. Contractor's Project Manager: Responsible for overall project coordination.

B. Make the following types of submittals to Contracting Officer Representative through the Project Coordinator:

1. Requests for Interpretation.
2. Requests for substitution.
3. Shop drawings, product data, and samples.
4. Test and inspection reports.
5. Design data.
6. Manufacturer's instructions and field reports.
7. Applications for payment and change order requests.
8. Progress schedules.
9. Coordination drawings.
10. Correction Punch List and Final Correction Punch List for Beneficial Occupancy.

11. Closeout submittals.

C. The Contractor shall provide project manager with minimum of five years experience on projects of similar size, scope, complexity, and cost. Project manager must be a full time employee of the General Contractor. Prior to construction the Contractor shall submit a resume of the project manager to the Government for approval.

D. In addition to the project manager, the Contractor shall provide a project superintendent who is dedicated, full time, to the project site. The construction superintendent shall have a minimum of five years experience serving as a project superintendent on projects of similar size, scope, complexity and cost. Prior to construction Contractor shall submit a resume of the project manager to the Government for approval.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRECONSTRUCTION MEETING

A. Contractor will schedule a meeting after notice to proceed.

B. Attendance Required:

1. Contracting Officer Representative
2. Architect.
3. Contractor.
4. All major sub contractors and suppliers.
5. Contracting Officer.

C. Agenda:

1. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
2. Designation of personnel representing the parties to Contract and .
3. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
4. Scheduling.

5. Use of "Newforma" online web application for RFI, submittals, etc... Refer to section 01 3001 for additional information.

D. Architect will record minutes and distribute copies after meeting to participants, with copies to Architect, Contracting Officer Representative(s), Contracting Officer, participants, and those affected by decisions made.

3.02 PROGRESS MEETINGS

A. Contractor shall make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.

B. Attendance Required: Job superintendent, Contractor's Project Manager, Contractor's Quality Control Supervisor, Contracting Officer, Contracting Officer Representative(s), Architect, and major Subcontractors/Suppliers when necessary/requested by the Government Contractor.

1. A minimum of bi-weekly meetings should be anticipated. More frequent meetings will be scheduled as dictated by the progress and quality of work observed ongoing at the project site. Contractor’s project superintendent and project manager shall attend all progress meetings in person.

2. Additionally, if a third-party project management approach is utilized by the General Contractor, both the third-party project manager and a representative of the General Contractor who is authorized to make decisions regarding project scope, cost, and time shall also be in attendance, in person, at a minimum of one progress meeting each month.

C. Agenda:

1. Review minutes of previous meetings.

2. Review of work progress.

3. Field observations, problems, and decisions.

4. Identification of problems that impede, or will impede, planned progress.

5. Review of submittals schedule and status of submittals.

6. Maintenance of progress schedule.

7. Corrective measures to regain projected schedules.

8. Planned progress during succeeding work period.

9. Maintenance of quality and work standards.

10. Effect of proposed changes on progress schedule and coordination.

11. Review of modifications to project record documents documenting changes made on site since previous progress meeting.

12. Other business relating to work.

D. Architect will record minutes and distribute copies after meeting to participants, with copies to Architect, Contracting Officer Representative(s), Contracting Officer, and Contractor. Contractor will be responsible for distributing minutes to suppliers/SubContractor and those affected by decisions made.

3.03 CONSTRUCTION PROGRESS SCHEDULE

A. Submit proposed project schedule as outlined in the Contract Documents.

B. General Requirements:

1. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Beneficial Occupancy to date of Final Completion.

2. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:

a. Activity Duration: Define activities so no activity is longer than twenty days, unless specifically allowed by the Government.

b. 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.

c. Submittal Review Time: Include review and resubmittal times indicated in Division 1 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.

d. Startup and Testing Time: Include not less than seven days for startup and testing.

e. Beneficial Occupancy: Indicate completion in advance of date established for Beneficial Occupancy, and allow time for the Government's administrative procedures necessary for certification of Beneficial Occupancy.

3. 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.

    a. Phasing: Arrange list of activities on schedule by phase.

    b. Work by the Government: Include a separate activity for each portion of the Work performed by the Government.

    c. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Division 1 Section "Summary." Delivery dates indicated stipulate the earliest possible delivery date.

    d. Government-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Division 1 Section "Summary." Delivery dates indicated stipulate the earliest possible delivery date.

    e. Work Restrictions: Show the effect of the following items on the schedule:

        1) Coordination with existing construction.

        2) Limitations of continued occupancies.

        3) Uninterruptible services.

        4) Partial occupancy before Beneficial Occupancy.

        5) Use of premises restrictions.

        6) Provisions for future construction.

        7) Seasonal variations.

        8) Environmental control.

4. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, review inspections by review agencies, Beneficial Occupancy, and Final Completion.

5. Cost Correlation: At the head of schedule, provide a cost correlation line, indicating planned and actual costs. On the line, show dollar volume of the Work performed as of dates used for preparation of payment requests.

    a. Refer to Division 1 Section "Payment Procedures" for cost reporting and payment procedures.

6. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragnets to demonstrate the effect of the proposed change on the overall project schedule.

C. Gantt-Chart Schedule:

1. Submit a comprehensive, fully developed, horizontal Gantt-chart-type, Contractor's Construction Schedule within thirty days of date established fromthe Notice to Proceed . Base schedule on the Preliminary Construction Schedule and whatever updating and feedback was received since the start of Project.

2. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

   a. For construction activities that require 3 months or longer to complete, indicate an estimated completion percentage in ten percent increments within time bar.

D. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.

2. 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.

E. Distribution: Distribute copies of approved schedule to the Government, 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.

F. Conflicts in the Contract Documents: Where conflicts occur in the contract documents the more expensive option shall be included for the contractor's pricing purposes unless otherwise clarified in writing by the Government. Prior to execution of the work the Government shall be consulted of all options, and a decision will be rendered by the Government.

3.04 REPORTS

A. Daily Construction Reports: Prepare a daily construction report and email to all required parties by noon of the following work day, 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. Orders and requests of authorities having jurisdiction.
10. Applicable photographs, noting location and condition.

3.05 PRE-CONSTRUCTION PHOTOGRAPHS

A. Before starting construction, take one hundred color photographs and digital video recording of Project site and affected right-of-ways and surrounding properties and interior existing photos of affected areas from different vantage points, as directed by the Government. Show existing conditions adjacent to property.

3.06 PROGRESS PHOTOGRAPHS

A. Submit photographs with each application for payment, taken not more than 3 days prior to submission of application for payment.

B. Photography Type: Digital; electronic files.

C. Provide photographs of construction throughout progress of Work produced by an experienced photographer, who can also be an employee of the contractor, acceptable to the Government.

D. In addition to periodic, recurring views, take photographs of each of the following events:

1. Completion of site clearing.
2. Excavations in progress.
3. Foundations in progress and upon completion.
4. Structural framing in progress and upon completion.
5. Enclosure of building, upon completion.
6. Final completion, minimum of ten (10) photos.

E. Views:

1. Provide non-aerial photographs from four cardinal views at each specified time, until date of Beneficial Occupancy.
2. Consult with the Government for instructions on views required.
3. Provide factual presentation.
4. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.

F. Digital Photographs: 24 bit color, minimum resolution of 1600 by 1200 ("2 megapixel"), in JPG format; provide files unaltered by photo editing software.

1. Delivery Medium: Via Newforma.
2. File Naming: Include project identification, date and time of view, and view identification.

3.07 SUBMITTALS

A. See section 01 3001 - Submittals.

END OF SECTION

SECTION 013001 - SUBMITTALS

PART I - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Preparing and processing of submittals for review and action.
2. Preparing and processing of informational submittals.

B. Submit the following for the Contracting Officer's review and action:

1. Shop drawings.
2. Structural design information required by the contract documents.
3. Product data.
4. Samples.
5. Submittals indicated as "for approval."
6. Submittals for which procedures are not defined elsewhere.
7. Submittal register.

C. Submit the following as informational submittals:

1. Certificates.
2. Coordination drawings.
3. Reports.
4. Qualification statements for manufacturers/installers.
5. Submittals indicated as "for information only."

D. Specific submittals required are described in individual sections.

E. Related Sections: The following are specified elsewhere in Division 1:

1. Product submittals:
   a. Product option submittals.

b. Requests for substitution.

c. Operating and maintenance data.

d. Warranties.

e. Maintenance materials and tools.

2. Contract closeout submittals:

a. Equipment and systems demonstration reports.

b. Request for determination of Beneficial Occupancy.

c. Certificate of occupancy.

d. Project record documents.

e. Bonds.

1.02 DEFINITIONS

A. Shop Drawings: See General Conditions.

1. Shop drawings also include:

a. Product data specifically prepared for this project.

b. Shop or plant inspection and test reports, when made on specific materials, products, or systems to be used in the work.

B. Product Data: See General Conditions.

1. Product data submittals also include:

a. Performance curves, when issued by the manufacturer for all products of that type.

b. Selection data showing standard colors.

c. Wiring diagrams, when standard for all products of that type.

C. Samples: See General Conditions.

D. Informational Submittals: Submittals identified in the contract documents as to be submitted for information only.

1.03 FORM OF SUBMITTALS

A. Use AF Form 3000 as the only acceptable form of approval and transmittal.

1. Transmit submittal data (including AF Form 3000) electronically. The Architect will provide and maintain an online website electrical submittal database for access by the Government, Architect, and Contractor.

2. Paper format submittals will not be accepted except where specifically approved by the Government prior to submission.

3. Use of Architect's "Newforma" Website Application:

   a. General Contractor shall use Architect's website software Newforma with access provided by the Architect to conduct all submittal reviews in electronic format.

   b. All recordkeeping, date stamping, access controls, shall be accomplished and managed by the contractor with access given to the entire project team.

   c. The software is capable of the following:

      1) Markups & notations- marked electronically,

      2) Sending submittals - Instant transfer, no maximum size

      3) Logging & tracking,

      4) Automatic reminders of outstanding items,

      5) Central list of all required submittals for project team to work from,

      6) Access for all team members to monitor submittal status & progress,

      7) Clear version history with record of changes at each step.

   d. Contractor shall be responsible for any scanning required to upload PDFs.

      1) All submittals must bear the stamp of the General Contractor indicating that the General Contractor's personnel have reviewed the submittal for compliance with project requirements prior to uploading the submittal to "Newforma."

   e. Orientation to the software is available on Newforma.com or Newformant.com.

4. In addition, all RFIs, proposals, pay requests, action items, and electronic document management will be handled thru the Newforma Info Exchange site.

5. Upon approval of all submittals, the Contractor shall furnish the Government one hard copy of the reviewed submittal complete with all review comments, markups, and a completed AF Form 3000 for project record.

B. Physical samples: 3 sets of each.

1. 1 set will be returned.

2. Physical samples shall be sent via mail, overnight delivery, or courier at the Contractor's discretion but be logged into "Newforma" by the Contractor for tracking and reference.

3. If additional sets are needed by other entities involved in work represented by the samples, submit with original submittal.

4. Copies in excess of the number requested will not be returned.

C. Submittals for Operation & Maintenance:

1. Provide all submittal data for operation & maintenance in electronic format.

2. In addition to the electronic format, provide two copies of original warranty documentation for all specified warranties.

a. Warranty documentation to be 3-hole punched and bound together in a 3 ring binder.

b. Warranty documentation should be tabbed and organized by specification section.

1.04 COORDINATION OF SUBMITTALS

A. Coordinate submittals and activities that must be performed in sequence, so that the Contracting Officer and Contracting Officer Representative(s) have enough information to properly review the submittals.

B. Coordinate submittals of different types for the same product or system so that the Contracting Officer and Contracting Officer Representative(s) have enough information to properly review each submittal.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 TIMING OF SUBMITTALS

A. Transmit each submittal at or before the time indicated on the approved schedule of submittals.

1. Prepare and submit for approval a schedule showing the required dates of submittal of all submittals.

2. Organize the schedule by the applicable specification section number.

3. Incorporate the contractor's construction schedule specified elsewhere.

4. Incorporate the quality control activities schedule specified elsewhere.

5. Submit within 15 days after commencement of the work.

6. Revise and resubmit the schedule for approval when requested.

B. Deliver each submittal requiring approval in time to allow for adequate review and processing time, including resubmittals if necessary; failure of the contractor in this respect will not be considered as grounds for an extension of the contract time.

C. Deliver each informational submittal prior to start of the work involved, unless the submittal is of a type which cannot be prepared until after completion of the work; submit promptly.

D. If a submittal must be processed within a certain time in order to maintain the progress of the work, state so clearly on the submittal.

E. If a submittal must be delayed for coordination with other submittals not yet submitted, the Contracting Officer may either return the submittal with no action or notify the contractor of the other submittals which must be received before the submittal can be reviewed.

3.02 SUBMITTAL PROCEDURES - GENERAL

A. Contractor Review: Sign each copy of each submittal certifying compliance with the requirements of the contract documents.

B. Notify the Contracting Officer, in writing and at time of submittal, of all points upon which the submittal does not conform to the requirements of the contract documents, if any.

C. Do not commence work which requires review of any submittals until receipt of returned submittals with an acceptable action.

D. Do not allow submittals without an acceptable action marking to be used for the project.

E. Do not submit substitute items that have not been approved by means of the procedure specified elsewhere.

F. Do not include requests for substitution (either direct or indirect) on submittals; comply with procedures for substitutions specified elsewhere.

G. Preparation of Submittals:

1. Label each copy of each submittal, with the following information:

    a. Project name.

    b. Date of submittal.

    c. Contractor's name and address.

    d. Architect's name and address.

    e. Subcontractor's name and address.

    f. Supplier's name and address.

    g. Manufacturer's name.

    h. Specification section where the submittal is specified.

    i. Numbers of applicable drawings and details.

    j. Other necessary identifying information.

    k. Indicate whether manufacturer or other source is listed on the Government's preferred vendor list.

    l. Use AF Form 3000 for the approval of submittal.

2. When applicable, pack submittals suitably for shipment.

3. Submittals to receive Contracting Officer's action marking: Provide blank space on the label or on the submittal itself for action marking; minimum 4 inches wide by 5 inches high.

H. Transmittal of Submittals:

1. Submit all submittals to the Government.

2. Submittals will be accepted from the contractor only. Submittals received from other entities will be returned without review or action.

3. Submittals received without a transmittal form will be returned without review or action.

   a. Project name.

   b. Submittal date.

   c. Transmittal number.

   d. Specification section number.

   e. To:

   f. From:

   g. Contractor's name.

   h. Subcontractor's and supplier's names.

   i. Manufacturer's name.

   j. Submittal type (shop drawing, product data, sample, informational submittal).

   k. Description of submittal.

   l. Records of distribution.

   m. Action marking.

   n. Comments.

4. Fill out a separate transmittal form for each submittal; also include the following:

   a. Other relevant information.

   b. Requests for additional information.

I. NOTE ADDITIONAL INFORMATION ON RESUBMITTALS. In the event a re-submittal is required one re-submittal will be processed at no charge to the contractor.

3.03 SHOP DRAWINGS

A. Content: Include the following information:

1. Dimensions, at accurate scale.
2. All field measurements that have been taken, at accurate scale.
3. Names of specific products and materials used.
4. Details, identified by contract document sheet and detail numbers.
5. Show compliance with the specific standards referenced.
6. Coordination requirements; show relationship to adjacent or critical work.
7. Name of preparing firm.

B. Preparation:

1. Reproductions of contract documents are not acceptable as shop drawings.
2. Copies of standard printed documents are not acceptable as shop drawings.
3. Identify as indicated for all submittals.
4. Space for Contracting Officer's action marking shall be adjacent to the title block.

3.04 PRODUCT DATA

A. When product data submittals are prepared specifically for this project (in the absence of standard printed information) submit such information as shop drawings and not as product data submittals.

B. Content:

1. Submit manufacturer's standard printed data sheets.
2. Identify the particular product being submitted; submit only pertinent pages.
3. Show compliance with properties specified.
4. Identify which options and accessories are applicable.
5. Include recommendations for application and use.
6. Show compliance with the specific standards referenced.

7. Show compliance with specified testing agency listings; show the limitations of their labels or seals, if any.

8. Identify dimensions which have been verified by field measurement.

9. Show special coordination requirements for the product.

3.05 SAMPLES

A. Samples:

1. Provide samples that are the same as proposed product.

B. Preparation:

1. Attach a description to each sample.

2. Attach name of manufacturer or source to each sample.

3. Where compliance with specified properties is required, attach documentation showing compliance.

4. Where there are limitations in availability, delivery, or other similar characteristics, attach description of such limitations.

3.06 REVIEW OF SUBMITTALS

A. Submittals for approval will be reviewed, marked with appropriate action, and returned.

B. Informational submittals: Submittals will be reviewed.

1. "X" action: No action taken.

2. "Not Approved" action: Revise the submittal or prepare a new submittal complying with the comments made.

3.07 RETURN, RESUBMITTAL, AND DISTRIBUTION

A. Submittals will be returned via the Newforma website.

B. Perform resubmittals in the same manner as original submittals; indicate all changes other than those requested by the Contracting Officer.

C. Distribution:

1. Distribute returned submittals to all subcontractors and suppliers involved in work covered by the submittal.

2. Record distribution on transmittal form.

3.08 SUBMITTAL REGISTER

A. Contractor to provide a register of submittals required under this contract. Register to include information as shown in sample register at the end of this section.

END OF SECTION

SCHEDULE OF MATERIAL SUBMITTALS	PROJECT NUMBER	PROJECT TITLE	SOLICITATION/CONTRACT NO.
	FAKZ182357	F-35: Convert 1407 to AGE	<CONTRACT #>

TO BE COMPLETED BY PROJECT MANAGER													TO BE COMPLETED BY CONTRACT ADMINISTRATOR						
		NO. OF COPIES REQUIRED																	
LINE NUMBER	ITEM OR DESCRIPTION OF ITEM, CONTRACT REFERENCE, TYPE OF SUBMITTAL	CERTIFICATION OF COMPLIANCE	SHOP DRAWINGS	SAMPLES	COLOR SELECTION	MANUFACTURER'S RECOMMENDATIONS	MANUFACTURER'S WARRANTY	CATALOG DATA	OPERATING INSTRUCTIONS	DATA	DOCUMENT\ REPORT	REQUIRED SUBMISSION DATE	DATE TO CIVIL ENGINEERING	RETURN SUSPENSE DATE	DATE CONTRACTOR NOTIFIED		CONTRACTOR RESUBMITTAL	FINAL APPROVAL	REMARKS
															APPROVED	DIS-APPROVED			
	Division 1 - General Requirments																		
1	Section 01 0450, Cutting and Patching, Cutting & Patching Proposal								D			NTP + 21 DAYS							
2	Section 01 0500, Field Engineering, Certificates	D										NTP + 21 DAYS							
3	Section 01 0500, Field Engineering, Record Documents										D	NTP + 21 DAYS							
4	Section 01 0500, Field Engineering, Dig Permit									D		NTP + 21 DAYS							
5	Section 01 2000, Price and Payment Procedures, Schedule of Values								D			NTP + 21 DAYS							
6	Section 01 3000, Administrative Requirements, Project Manager Resume									D		NTP + 21 DAYS							
7	Section 01 3000, Administrative Requirements, Superintendent Resume									D		NTP + 21 DAYS							
8	Section 01 3000, Administrative Requirements, Proposed Schedulel									D		NTP + 21 DAYS							
9	Section 01 3000, Administrative Requirements, Pre-Construction Photos									D		NTP + 21 DAYS							
10	Section 01 3000, Administrative Requirements, Construction Quality Control Resume									D		NTP + 21 DAYS							
11	Section 01 3001, Submittals, Submittal Register									D		NTP + 21 DAYS							
12	Section 01 3225, Project Sustainability Summary, Final Commissioning Report										D	NTP + 21 DAYS							
13	Section 01 3329, Sustainable Design Reporting, HPSB Checklist										D	NTP + 21 DAYS							
14	Section 01 3329, Sustainable Design Reporting, Prelminary Sustainability eNotebook										D	NTP + 21 DAYS							
15	Section 01 3329, Sustainable Design Reporting, Final Sustainability eNotebook										D	NTP + 21 DAYS							
16	Section 01 3329, Sustainable Design Reporting, Amended Sustainability eNotebook										D	NTP + 21 DAYS							
17	Section 01 4000, Quality Requirments, Testing Agency Qualifications	D										NTP + 21 DAYS							
18	Section 01 5460, Safety and Health, Site Specific Safety and Quality Control Plan									D		NTP + 21 DAYS							
19	Section 01 5460, Safety and Health,Hazardous Material Certificates	D										NTP + 21 DAYS							
20	Section 01 5719, Temporary Environmental Controls, Management Plan		D									NTP + 21 DAYS							
21	Section 01 5719, Temporary Environmental Controls, Finish Installation Schedule		D									NTP + 21 DAYS							
22	Section 01 5719, Temporary Environmental Controls, Air Containment Test Plan										D	NTP + 21 DAYS							
23	Section 01 5719, Temporary Environmental Controls,Ventilation Effectiveness										D	NTP + 21 DAYS							
24	Section 01 6000, Product Requirements, Product Data Submittals									D		NTP + 21 DAYS							
25	Section 01 6000, Product Requirements, Shop Drawing Submittals		D									NTP + 21 DAYS							
26	Section 01 6000, Product Requirements, Sample Submittals			D								NTP + 21 DAYS							
27	Section 01 6116, RIB Volatile Organic Compound, Evidence of Compliance										D	NTP + 21 DAYS							

SCHEDULE OF MATERIAL SUBMITTALS	PROJECT NUMBER	PROJECT TITLE	SOLICITATION/CONTRACT NO.
	FAKZ182357	F-35: Convert 1407 to AGE	<CONTRACT #>

TO BE COMPLETED BY PROJECT MANAGER													TO BE COMPLETED BY CONTRACT ADMINISTRATOR					
		NO. OF COPIES REQUIRED																
LINE NUMBER	ITEM OR DESCRIPTION OF ITEM, CONTRACT REFERENCE, TYPE OF SUBMITTAL	CERTIFICATION OF COMPLIANCE	SHOP DRAWINGS	SAMPLES	COLOR SELECTION	MANUFACTURER'S RECOMMENDATIONS	MANUFACTURER'S WARRANTY	CATALOG DATA	OPERATING INSTRUCTIONS	DATA	DOCUMENT\ REPORT	REQUIRED SUBMISSION DATE	DATE TO CIVIL ENGINEERING	RETURN SUSPENSE DATE	DATE CONTRACTOR NOTIFIED		CONTRACTOR RESUBMITTAL	FINAL APPROVAL	REMARKS
															APPROVED	DIS-APPROVED			
28	Section 01 6116, RIB Volatile Organic Compound, Product Data									D		NTP + 21 DAYS							
29	Section 01 7000, Execution and Closeout Requirements, Surveyor Qualifications									D		NTP + 21 DAYS							
30	Section 01 7000, Execution and Closeout Requirements, Surveyor Errors & Omissions Coverage									D		NTP + 21 DAYS							
31	Section 01 7000, Execution and Closeout Requirements, Record Documents		D							D		NTP + 21 DAYS							
32	Section 01 7000, Execution and Closeout Requirements, Demoliton Plan		D									NTP + 21 DAYS							
33	Section 01 7000, Execution and Closeout Requirements, Demolition Firm Qualifications										D	NTP + 21 DAYS							
34	Section 01 7000, Execution and Closeout Requirements, Surveyor Errors & Omissions Coverage	D										NTP + 21 DAYS							
35	Section 01 7419, Construction Waste Management and Disposal, Waste Management Plan									D		NTP + 21 DAYS							
36	Section 01 7419, Construction Waste Management and Disposal, Waste Disposal Reports										D	NTP + 21 DAYS							
37	Section 01 7800, Closeout Submittals, Project Record Drawings		D									NTP + 21 DAYS							
38	Section 01 7800, Closeout Submittals, Project Record Specifications									D		NTP + 21 DAYS							
39	Section 01 7800, Closeout Submittals, Project Record Addenda									D		NTP + 21 DAYS							
40	Section 01 7800, Closeout Submittals, Project Record Change Orders									D		NTP + 21 DAYS							
41	Section 01 7800, Closeout Submittals, Project Record Reviewed Shop Drawings		D									NTP + 21 DAYS							
42	Section 01 7800, Closeout Submittals, Project Record Manufacturer's Installation Instructions					D						NTP + 21 DAYS							
43	Section 01 7800, Closeout Submittals, Project Record Operation & Maintenance Data									D		NTP + 21 DAYS							
44	Section 01 7800, Closeout Submittals, Project Record Care & Maintenance Data									D		NTP + 21 DAYS							
45	Section 01 7800, Closeout Submittals, Project Warranties & Bonds						3					NTP + 21 DAYS							
46	Section 01 7800, Closeout Submittals, Project Attic Stock/Extra Materials											NTP + 21 DAYS							Quantity per specific specification sections
47	Section 01 7900, Demonstration and Training, Draft Training Plans									D		NTP + 21 DAYS							
48	Section 01 7900, Demonstration and Training, Training Manuals									D		NTP + 21 DAYS							
49	Section 01 7900, Demonstration and Training, Training Reports										D	NTP + 21 DAYS							
50	Section 01 7900, Demonstration and Training, Video Recordings									D		NTP + 21 DAYS							
51	Section 01 9113 - General Commissioning Requirements, Commissioning Schedule									D		NTP + 21 DAYS							
52	Section 01 9100.15 - Total Building Commissioning, Start Up Plan									D		NTP + 21 DAYS							
53	Section 01 9100.15 - Total Building Commissioning, Start Up Report										D	NTP + 21 DAYS							
54	Section 01 9100.15 - Total Building Commissioning, Prefunctional Checklists										D	NTP + 21 DAYS							

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LINE NUMBER	ITEM OR DESCRIPTION OF ITEM, CONTRACT REFERENCE, TYPE OF SUBMITTAL	CERTIFICATION OF COMPLIANCE	SHOP DRAWINGS	SAMPLES	COLOR SELECTION	MANUFACTURER'S RECOMMENDATIONS	MANUFACTURER'S WARRANTY	CATALOG DATA	OPERATING INSTRUCTIONS	DATA	DOCUMENT\ REPORT	REQUIRED SUBMISSION DATE	DATE TO CIVIL ENGINEERING	RETURN SUSPENSE DATE	DATE CONTRACTOR NOTIFIED		CONTRACTOR RESUBMITTAL	FINAL APPROVAL	REMARKS
															APPROVED	DIS-APPROVED			
	Division 2 - Existing Conditions																		
55	Section 02 4100, Selective Demolition, Site Plan		D									NTP + 21 DAYS							
56	Section 02 4100, Selective Demolition, Demoliution Plan		D									NTP + 21 DAYS							
57	Section 02 4100, Selective Demolition, Record Documents								D			NTP + 21 DAYS							
58	Section 02 4100, Selective Demolition, Demolition Firm Qualifications	D										NTP + 21 DAYS							
	Division 3 - Concrete - Concrete											NTP + 21 DAYS							
59	Section 03 3000, Cast-In-Place Concrete, Product Data									D		NTP + 21 DAYS							
60	Section 03 3000, Cast-In-Place Concrete, Samples			3								NTP + 21 DAYS							
61	Section 03 3000, Cast-In-Place Concrete, Test Reports										D	NTP + 21 DAYS							
62	Section 03 3000, Cast-In-Place Concrete, Manufacturer's Installation Instructions					D						NTP + 21 DAYS							
63	Section 03 3000, Cast-In-Place Concrete, Sustainable Design Submittal										D	NTP + 21 DAYS							
64	Section 03 3000, Cast-In-Place Concrete, Material Certificates	D										NTP + 21 DAYS							
65	Section 03 3000, Cast-In-Place Concrete, Formwork Shop Drawings		D									NTP + 21 DAYS							
66	Section 03 3000, Cast-In-Place Concrete, Steel Reinforcement Shop Drawings		D									NTP + 21 DAYS							
67	Section 03 3000, Cast-In-Place Concrete, Design Mix									D		NTP + 21 DAYS							
68	Section 03 3000, Cast-In-Place Concrete, Installer Qualifications	D										NTP + 21 DAYS							
69	Section 03 3680, Concrete Polishing and Dying, Product Data									D		NTP + 21 DAYS							
70	Section 03 3680, Concrete Polishing and Dying, Applicator Qualification Data	D										NTP + 21 DAYS							
71	Section 03 3680, Concrete Polishing and Dying, Samples			3								NTP + 21 DAYS							
72	Section 03 3680, Concrete Polishing and Dying, Maintenance Procedures								D			NTP + 21 DAYS							
73	Section 03 3680, Concrete Polishing and Dying, Sustainability Submittal										D	NTP + 21 DAYS							
	Division 4 - Masonry											NTP + 21 DAYS							
74	Section 04 2000, Unit Masonry, Product Data									D		NTP + 21 DAYS							
75	Section 04 2000, Unit Masonry, Samples			3								NTP + 21 DAYS							
76	Section 04 2000, Unit Masonry, Manufacturer's Certificate	D										NTP + 21 DAYS							
77	Section 04 2000, Unit Masonry, Sustainability Submittals									D		NTP + 21 DAYS							
	Division 5 - Metals											NTP + 21 DAYS							
78	Section 05 1200, Structural Steel Framing, Shop Drawings		D									NTP + 21 DAYS							
79	Section 05 1200, Structural Steel Framing, Milll Certificates	D										NTP + 21 DAYS							
80	Section 05 1200, Structural Steel Framing, Fabricator Qualification Data	D										NTP + 21 DAYS							
81	Section 05 1200, Structural Steel Framing, Erector Qualification Data	D										NTP + 21 DAYS							
82	Section 05 1200, Structural Steel Framing, Sustainability Submittals									D		NTP + 21 DAYS							
83	Section 05 2100, Steel Joist Framing, Shop Drawings		D									NTP + 21 DAYS							
84	Section 05 2100, Steel Joist Framing, Welder's Certificates	D										NTP + 21 DAYS							

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															APPROVED	DIS-APPROVED			
85	Section 05 2100, Steel Joist Framing, Erector Qualifications									D		NTP + 21 DAYS							
86	Section 05 2100, Steel Joist Framing, Sustainability Submittals									D		NTP + 21 DAYS							
87	Section 05 3100, Steel Decking, Shop Drawings		D									NTP + 21 DAYS							
88	Section 05 3100, Steel Decking, Product Data									D		NTP + 21 DAYS							
89	Section 05 3100, Steel Decking, Certificates	D										NTP + 21 DAYS							
90	Section 05 3100, Steel Decking, Installation Instructions					D						NTP + 21 DAYS							
91	Section 05 3100, Steel Decking, Welder's Certificates	D										NTP + 21 DAYS							
92	Section 05 3100, Steel Decking, Installer Qualifications	D										NTP + 21 DAYS							
93	Section 05 3100, Steel Decking, Sustainability Submittals									D		NTP + 21 DAYS							
94	Section 05 5000, Metal Fabrications, Shop Drawings		D									NTP + 21 DAYS							
95	Section 05 5000, Metal Fabrications, Welder's Certificates	D										NTP + 21 DAYS							
96	Section 05 5000, Metal Fabrications, Sustainability Submittal									D		NTP + 21 DAYS							
97	Section 05 5213, Pipe and Tube Railings, Shop Drawings		D									NTP + 21 DAYS							
98	Section 05 5213, Pipe and Tube Railings, Sustainability Submittal									D		NTP + 21 DAYS							
	Division 6 - Wood, Plastics, and Composites											NTP + 21 DAYS							
99	Section 06 1000, Rough Carpentry, Product Data									D		NTP + 21 DAYS							
100	Section 06 1000, Rough Carpentry, Sustainability Submittal									D		NTP + 21 DAYS							
101	Section 06 4100, Architectural Wood Casework, Shop Drawings		D									NTP + 21 DAYS							
102	Section 06 4100, Architectural Wood Casework, Samples			3								NTP + 21 DAYS							
103	Section 06 4100, Architectural Wood Casework, Sustainability Submittal									D		NTP + 21 DAYS							
104	Section 06 4100, Architectural Wood Casework, Fabricator Qualifications	D										NTP + 21 DAYS							
	Division 7 - Thermal & Moisture Protection																		
105	Section 07 0100, Special Project Roofing Warranty, Warranty						3					END OF CONTRACT							
106	Section 07 2100, Thermal Insulation, Product Data									D		NTP + 21 DAYS							
107	Section 07 2100, Thermal Insulation, Manufacturer's Installation Instructions					D						NTP + 21 DAYS							
108	Section 07 2100, Thermal Insulation, Sustainability Submittal									D		NTP + 21 DAYS							
109	Section 07 5400, Thermoplastic Membrane Roofing, Product Data									D		NTP + 21 DAYS							
110	Section 07 5400, Thermoplastic Membrane Roofing, Shop Drawings		D									NTP + 21 DAYS							
111	Section 07 5400, Thermoplastic Membrane Roofing, Samples			3								NTP + 21 DAYS							
112	Section 07 5400, Thermoplastic Membrane Roofing, Manufacturer's Certificate	D										NTP + 21 DAYS							
113	Section 07 5400, Thermoplastic Membrane Roofing, Manufacturer's Installation Instructions					D						NTP + 21 DAYS							
114	Section 07 5400, Thermoplastic Membrane Roofing, Manufacturer's Field Reports										D	NTP + 21 DAYS							
115	Section 07 5400, Thermoplastic Membrane Roofing, Sustainability Submittals									D		NTP + 21 DAYS							

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															APPROVED	DIS-APPROVED			
116	Section 07 5400, Thermoplastic Membrane Roofing, Warranty						3					END OF CONTRACT							
117	Section 07 5400, Thermoplastic Membrane Roofing, Manufacturer Qualifications	D										NTP + 21 DAYS							
118	Section 07 5400, Thermoplastic Membrane Roofing, Installer Qualifications	D										NTP + 21 DAYS							
119	Section 07 6200, Sheet Metal Flashing and Trim, Shop Drawings		D									NTP + 21 DAYS							
120	Section 07 6200, Sheet Metal Flashing and Trim, Samples			3								NTP + 21 DAYS							
121	Section 07 6200, Sheet Metal Flashing and Trim, Sustainability Submittals									D		NTP + 21 DAYS							
122	Section 07 6200, Sheet Metal Flashing and Trim, Fabricator and Installer Qualifications	D										NTP + 21 DAYS							
123	Section 07 6200, Sheet Metal Flashing and Trim, ES-1 Verification	D										NTP + 21 DAYS							
124	Section 07 6500, Wall Flashing, Product Data									D		NTP + 21 DAYS							
125	Section 07 6500, Wall Flashing, Shop Drawings		D									NTP + 21 DAYS							
126	Section 07 6500, Wall Flashing, Test Reports										D	NTP + 21 DAYS							
127	Section 07 6500, Wall Flashing, Warranty						3					END OF CONTRACT							
128	Section 07 7100, Roof Specialties, Product Data									D		NTP + 21 DAYS							
129	Section 07 7100, Roof Specialties, Samples			3								NTP + 21 DAYS							
130	Section 07 7100, Roof Specialties, Shop Drawings		D									NTP + 21 DAYS							
131	Section 07 7100, Roof Specialties, Sustainability Submittals									D		NTP + 21 DAYS							
132	Section 07 7100, Roof Specialties, Manufacturer Qualification Data										D	NTP + 21 DAYS							
133	Section 07 7100, Roof Specialties, Product Certificates	D										NTP + 21 DAYS							
134	Section 07 7100, Roof Specialties, Product Test Report										D	NTP + 21 DAYS							
135	Section 07 7100, Roof Specialties, Sample Warranty							D				NTP + 21 DAYS							
136	Section 07 7100, Roof Specialties, Closeout Submittal											END OF CONTRACT							
137	Section 07 8400 - Firestopping, Manufacturer Qualifications	D										NTP + 21 DAYS							
138	Section 07 8400 - Firestopping, Installer Qualifications	D										NTP + 21 DAYS							
139	Section 07 9005, Joint Sealers, Product Data									D		NTP + 21 DAYS							
140	Section 07 9005, Joint Sealers, Samples			3								NTP + 21 DAYS							
141	Section 07 9005, Joint Sealers, Manufacturer's Sample Warranty						D					NTP + 21 DAYS							
142	Section 07 9005, Joint Sealers, Installation Instructions					D						NTP + 21 DAYS							
143	Section 07 9005, Joint Sealers, Manufacturer Qualifications	D										NTP + 21 DAYS							
144	Section 07 9005, Joint Sealers, Applicator Qualifications	D										NTP + 21 DAYS							
145	Section 07 9005, Joint Sealers, Sustainability Submittal									D		NTP + 21 DAYS							
146	Section 07 9005, Joint Sealers, Warranty						3					END OF CONTRACT							
	Division 8 - Openings																		
147	Section 08 1113, Hollow Metal Doors and Frames, Product Data									D		NTP + 21 DAYS							
148	Section 08 1113, Hollow Metal Doors and Frames, Shop Drawings		D									NTP + 21 DAYS							
149	Section 08 1113, Hollow Metal Doors and Frames, Installation Instructions					D						NTP + 21 DAYS							

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															APPROVED	DIS-APPROVED			
150	Section 08 1113, Hollow Metal Doors and Frames, Manufacturer Qualification	D										NTP + 21 DAYS							
151	Section 08 1113, Hollow Metal Doors and Frames, Sustainability Submittals									D		NTP + 21 DAYS							
152	Section 08 1416, Flush Wood Doors, Product Data									D		NTP + 21 DAYS							
153	Section 08 1416, Flush Wood Doors, Shop Drawings		D									NTP + 21 DAYS							
154	Section 08 1416, Flush Wood Doors, Samples			D								NTP + 21 DAYS							
155	Section 08 1416, Flush Wood Doors, Manuafacturer's Installation Instructions								D			NTP + 21 DAYS							
156	Section 08 1416, Flush Wood Doors, Warranty						D					NTP + 21 DAYS							
157	Section 08 1416, Flush Wood Doors, Sustainability Submittals										D	NTP + 21 DAYS							
158	Section 08 3323, Overhead Coiling Doors, Product Data									D		NTP + 21 DAYS							
159	Section 08 3323, Overhead Coiling Doors, Shop Drawings		D									NTP + 21 DAYS							
160	Section 08 3323, Overhead Coiling Doors, Manufacturer's Instructions					D						NTP + 21 DAYS							
161	Section 08 3323, Overhead Coiling Doors, Maintenance Data								D			NTP + 21 DAYS							
162	Section 08 3323, Overhead Coiling Doors, Sustainability Submittals										D	NTP + 21 DAYS							
163	Section 08 4113, Aluminum Framed Entrances, Product Data									D		NTP + 21 DAYS							
164	Section 08 4113, Aluminum Framed Entrances, Shop Drawings		D									NTP + 21 DAYS							
165	Section 08 4113, Aluminum Framed Entrances, Samples			3								NTP + 21 DAYS							
166	Section 08 4113, Aluminum Framed Entrances, Design Data									D		NTP + 21 DAYS							
167	Section 08 4113, Aluminum Framed Entrances, Sustainability Submittals									D		NTP + 21 DAYS							
168	Section 08 4113, Aluminum Framed Entrances, Draft Warranty						D					NTP + 21 DAYS							
169	Section 08 4413, Glazed Aluminum Curtain Walls, Product Data									D		NTP + 21 DAYS							
170	Section 08 4413, Glazed Aluminum Curtain Walls, Shop Drawings		D									NTP + 21 DAYS							
171	Section 08 4413, Glazed Aluminum Curtain Walls, Samples			3								NTP + 21 DAYS							
172	Section 08 4413, Glazed Aluminum Curtain Walls, Test Reports										D	NTP + 21 DAYS							
173	Section 08 4413, Glazed Aluminum Curtain Walls, Design Data									D		NTP + 21 DAYS							
174	Section 08 4413, Glazed Aluminum Curtain Walls, Manufacturer's Certificate	D										NTP + 21 DAYS							
175	Section 08 4413, Glazed Aluminum Curtain Walls, Field Quality Control										D	NTP + 21 DAYS							
176	Section 08 4413, Glazed Aluminum Curtain Walls, Sample Warranty						D					NTP + 21 DAYS							
177	Section 08 4413, Glazed Aluminum Curtain Walls, Sustainability Submittal									D		NTP + 21 DAYS							
178	Section 08 7100, Door Hardware, Product Data									D		NTP + 21 DAYS							
179	Section 08 7100, Door Hardware, Hardware Schedule		D									NTP + 21 DAYS							
180	Section 08 7100, Door Hardware, Warranty						D					NTP + 21 DAYS							
181	Section 08 8000, Glazing, Product Data									D		NTP + 21 DAYS							
182	Section 08 8000, Glazing, Samples			1								NTP + 21 DAYS							
183	Section 08 8000, Glazing, Sample Warranty						D					NTP + 21 DAYS							
184	Section 08 8800, Glazing, Installer Qualifications	D										NTP + 21 DAYS							

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															APPROVED	DIS-APPROVED			
	Division 9 - Finishes																		
185	Section 09 0561, Common Work Results for Flooring Preparation, Testing Agency Report										D	NTP + 21 DAYS							
186	Section 09 5100, Acoustical Ceilings, Product Data									D		NTP + 21 DAYS							
187	Section 09 5100, Acoustical Ceilings, Samples			1								NTP + 21 DAYS							
188	Section 09 5100, Acoustical Ceilings, Manufacturer's Installation Instructions					D						NTP + 21 DAYS							
189	Section 09 5100, Acoustical Ceilings, Sustainability Submittal									D		NTP + 21 DAYS							
190	Section 09 5100, Acoustical Ceilings, Maintenance Materials											END OF CONTRACT							
191	Section 09 5100, Acoustical Ceilings, Manufacturer Qualifications	D										NTP + 21 DAYS							
192	Section 09 6500, Resilient Base, Product Data									D		NTP + 21 DAYS							
193	Section 09 6500, Resilient Base, Samples			3								NTP + 21 DAYS							
194	Section 09 6500, Resilient Base, Sustainability Submittals									D		NTP + 21 DAYS							
195	Section 09 6500, Resilient Base, Maintenance Data								D			NTP + 21 DAYS							
196	Section 09 6500, Resilient Base, Maintenance Materials											END OF CONTRACT							
197	Section 09 6500, Resilient Base, Installer Qualifications	D										NTP + 21 DAYS							
198	Section 09 9113, Exterior Painting, Product Data									D		NTP + 21 DAYS							
199	Section 09 9113, Exterior Painting, Samples			3								NTP + 21 DAYS							
200	Section 09 9113, Exterior Painting, Manufacturer's Certification	D										NTP + 21 DAYS							
201	Section 09 9113, Exterior Painting, Manufacturer's Instructions					D						NTP + 21 DAYS							
202	Section 09 9113, Exterior Painting, Maintenance Data								D			NTP + 21 DAYS							
203	Section 09 9113, Exterior Painting, Manufacturer Qualifications	D										NTP + 21 DAYS							
204	Section 09 9113, Exterior Painting, Applicator Qualifications	D										NTP + 21 DAYS							
205	Section 09 9113, Exterior Painting, Maintenance Material											END OF CONTRACT							
206	Section 09 9123, Interior Painting, Product Data									D		NTP + 21 DAYS							
207	Section 09 9123, Interior Painting, Samples			3								NTP + 21 DAYS							
208	Section 09 9123, Interior Painting, Manufacturer's Certification	D										NTP + 21 DAYS							
209	Section 09 9123, Interior Painting, Manufacturer's Instructions					D						NTP + 21 DAYS							
210	Section 09 9123, Interior Painting, Sustainability Submittals									D		NTP + 21 DAYS							
211	Section 09 9123, Interior Painting, Maintenance Data								D			NTP + 21 DAYS							
212	Section 09 9123, Interior Painting, Maintenance Materials											END OF CONTRACT							
213	Section 09 9113, Interior Painting, Manufacturer Qualifications	D										NTP + 21 DAYS							
214	Section 09 9113, Interior Painting, Applicator Qualifications	D										NTP + 21 DAYS							
215	Section 09 9600, High-Performance Coatings, Product Data									D		NTP + 21 DAYS							
216	Section 09 9600, High-Performance Coatings, Manufacturer's Installation Instructions								D			NTP + 21 DAYS							
217	Section 09 9600, High-Performance Coatings, Samples			D								NTP + 21 DAYS							
218	Section 09 9600, High-Performance Coatings, Maintenance Data									D		NTP + 21 DAYS							

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															APPROVED	DIS-APPROVED			
219	Section 09 9600, High-Performance Coatings, Maintenance Materials									D		NTP + 21 DAYS							
220	Section 09 9600, High-Performance Coatings, Sustainability Submittals										D	NTP + 21 DAYS							
	Division 10 - Specialties											NTP + 21 DAYS							
221	Section 10 1400, Signage, Product Data									D		NTP + 21 DAYS							
222	Section 10 1400, Signage, Signage Schedule		D									NTP + 21 DAYS							
223	Section 10 1400, Signage, Samples			3								NTP + 21 DAYS							
224	Section 10 1400, Signage, Installation Instructions					D						NTP + 21 DAYS							
225	Section 10 1400, Signage, Maintenance Materials											END OF CONTRACT							
226	Section 10 1400, Signage, Sustainability Submittals									D		NTP + 21 DAYS							
227	Section 10 1400, Signage, Manufacturer Qualifications	D										NTP + 21 DAYS							
228	Section 10 2113, Stainless Steel Toilet Compartments, Product Data																		
229	Section 10 2113, Stainless Steel Toilet Compartments, Shop Drawings																		
230	Section 10 2113, Stainless Steel Toilet Compartments, Samples																		
231	Section 10 2113, Stainless Steel Toilet Compartments, Sustainability Submittals																		
232	Section 10 2223, Movable Wall System, Product Data																		
233	Section 10 2223, Movable Wall System, Installation Instructions																		
234	Section 10 2223, Movable Wall System, Samples																		
235	Section 10 2223, Movable Wall System, Sustainability Submittals																		
236	Section 10 2800, Toilet Bath and Laundry Accessories, Product Data																		
237	Section 10 2800, Toilet Bath and Laundry Accessories, Installation Instructions																		
238	Section 10 4400, Fire Protection Specialties, Manufacturer's Installation Instructions								D			NTP + 21 DAYS							
239	Section 10 4400, Fire Protection Specialties, Maintenance Data									D		NTP + 21 DAYS							
240	Section 10 4400, Fire Protection Specialties, Sustainability Submittals										D	NTP + 21 DAYS							
241	Section 10 5100, Lockers, Product Data									D		NTP + 21 DAYS							
242	Section 10 5100, Lockers, Shop Drawings		D									NTP + 21 DAYS							
243	Section 10 5100, Lockers, Manufacturer's Installation Instruction					D						NTP + 21 DAYS							
244	Section 10 5100, Lockers, Sustainability Submittals										D	NTP + 21 DAYS							
	Division 11 - Equipment																		
245	Section 11 3013, Residential Appliances, Product Data									D		NTP + 21 DAYS							
246	Section 11 3013, Residential Appliances, Manufacturer Warranty						D					NTP + 21 DAYS							
247	Section 11 3013, Residential Appliances, Sustainability Submittals										D	NTP + 21 DAYS							
248	Section 11 5213, Ceiling -Recessed Front Projection Screens, Product Data									D		NTP + 21 DAYS							
249	Section 11 5213, Ceiling -Recessed Front Projection Screens, Wiring Diagram		D									NTP + 21 DAYS							
250	Section 11 5213, Ceiling -Recessed Front Projection Screens, Shop Drawings		D									NTP + 21 DAYS							

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															APPROVED	DIS-APPROVED			
251	Section 11 5213, Ceiling -Recessed Front Projection Screens, Samples			3								NTP + 21 DAYS							
252	Section 11 5213, Ceiling -Recessed Front Projection Screens, Sustainability Submittals										D	NTP + 21 DAYS							
253	Section 11 5223, Audio-Visual Equipment Supports, Product Data									D		NTP + 21 DAYS							
254	Section 11 5223, Audio-Visual Equipment Supports, Shop Drawings		D									NTP + 21 DAYS							
255	Section 11 5223, Audio-Visual Equipment Supports, Samples			3								NTP + 21 DAYS							
256	Section 11 5223, Audio-Visual Equipment Supports, Sustainability Submittals										D	NTP + 21 DAYS							
	Division 12 - Furnishings																		
257	Section 12 2115, Operable Mesh Shades, Product Data									D		NTP + 21 DAYS							
258	Section 12 2115, Operable Mesh Shades, Shop Drawings		D									NTP + 21 DAYS							
259	Section 12 2115, Operable Mesh Shades, Manufacturer's Certification					D						NTP + 21 DAYS							
260	Section 12 2115, Operable Mesh Shades, Sustainability Submittals										D	NTP + 21 DAYS							
261	Section 12 2115, Operable Mesh Shades, Contract Closeout Submittals										D	NTP + 21 DAYS							
262	Section 12 3600, Countertops and Window Sills, Product Data									D		NTP + 21 DAYS							
263	Section 12 3600, Countertops and Window Sills, Shop Drawings		D									NTP + 21 DAYS							
264	Section 12 3600, Countertops and Window Sills, Samples			3								NTP + 21 DAYS							
265	Section 12 3600, Countertops and Window Sills, Test Reports										D	NTP + 21 DAYS							
266	Section 12 3600, Countertops and Window Sills, Installation Instructions					D						NTP + 21 DAYS							
267	Section 12 3600, Countertops and Window Sills, Maintenance Data								D			NTP + 21 DAYS							
268	Section 12 4813, Entrance Floor Mats and Frames, Product Data									D		NTP + 21 DAYS							
269	Section 12 4813, Entrance Floor Mats and Frames, Shop Drawings		D									NTP + 21 DAYS							
270	Section 12 4813, Entrance Floor Mats and Frames, Samples			3								NTP + 21 DAYS							
271	Section 12 4813, Entrance Floor Mats and Frames, Maintenance Data								D			NTP + 21 DAYS							
	Division 21 - Fire Protection																		
272	Section 21 1313, Wet Pipe Sprinkler System, Shop Drawings		D									NTP + 21 DAYS							
273	Section 21 1313, Wet Pipe Sprinkler System, Product Data									D		NTP + 21 DAYS							
274	Section 21 1313, Wet Pipe Sprinkler System, Design Data									D		NTP + 21 DAYS							
275	Section 21 1313, Wet Pipe Sprinkler System, Test Reports										D	7 DAYS FROM TEST COMPLETION							
276	Section 21 1313, Wet Pipe Sprinkler System, Certificates	D										NTP + 21 DAYS							
277	Section 21 1313, Wet Pipe Sprinkler System, Operation and Maintenance Data								D			END OF CONTRACT							
278	Section 21 1313, Wet Pipe Sprinkler System, Closeout Submittals								D			NTP + 21 DAYS							
279	Section 21 1313, Wet Pipe Sprinkler System, Fire Protection Specialist Qualifications	D										NTP + 21 DAYS							
280	Section 21 1313, Wet Pipe Sprinkler System, Fire Protectio Installer Qualifications	D										NTP + 21 DAYS							
281	Section 21 1313, Wet Pipe Sprinkler System, Extra Materials											END OF CONTRACT							

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															APPROVED	DIS-APPROVED			
282	Section 21 1313, Wet Pipe Sprinkler System, Coordination Drawings		D									NTP + 21 DAYS							
283	Section 21 1313, Wet Pipe Sprinkler System, Water Flow Test Report										D	NTP + 21 DAYS							
284	Section 21 1313, Wet Pipe Sprinkler System, Field Quality Control Reports										D	NTP + 21 DAYS							
285	Section 21 1313, Wet Pipe Sprinkler System, Field Test Report										D	NTP + 21 DAYS							
	Division 22 - Plumbing																		
286	Section 22 0000, Plumbing, Product Data									D		NTP + 21 DAYS							
287	Section 22 0000, Plumbing,Test Reports										D	NTP + 21 DAYS							
288	Section 22 0000, Plumbing, Certificates	D										NTP + 21 DAYS							
	Division 23 - Heating, Ventilating, & Air Conditioning (HVAC)																		
289	Section 23 0593, Testing Adjusting and Balancing, Product Data									D		NTP + 21 DAYS							
290	Section 23 0593, Testing Adjusting and Balancing, Qualifications	D										NTP + 21 DAYS							
291	Section 23 0700, Thermal Inslation for Mechanical Systems, Product Data									D		NTP + 21 DAYS							
292	Section 23 0900, Instrumentation and Control for HVAC, Shop Drawings		D									NTP + 21 DAYS							
293	Section 23 0900, Instrumentation and Control for HVAC, Product Data									D		NTP + 21 DAYS							
294	Section 23 0900, Instrumentation and Control for HVAC, Design Data									D		NTP + 21 DAYS							
295	Section 23 0900, Instrumentation and Control for HVAC, Operation and Maintenance Data										D	END OF CONTRACT							
296	Section 23 3000, HVAC Air Distribution, Product Data									D		NTP + 21 DAYS							
297	Section 23 3000, HVAC Air Distribution, Manufacturer's Instructions										D	NTP + 21 DAYS							
298	Section 23 3000, HVAC Air Distribution, Operations and Maintenance Data										D	END OF CONTRACT							
299	Section 23 100.20, Unitary Air Conditioning Equipment, Shop Drawings		D									NTP + 21 DAYS							
300	Section 23 100.20, Unitary Air Conditioning Equipment, Product Data									D		NTP + 21 DAYS							
301	Section 23 100.20, Unitary Air Conditioning Equipment, Test Report										D	NTP + 21 DAYS							
302	Section 23 100.20, Unitary Air Conditioning Equipment, Operational and Maintenance Data										D	NTP + 21 DAYS							
303	Section 23 8200.20, Terminal Heating Units, Product Data									D		NTP + 21 DAYS							
304	Section 23 8200.20, Terminal Heating Units, Operations and Maintenance Data										D	NTP + 21 DAYS							
	Division 25 - Utility Monitoring											NTP + 21 DAYS							
305	Section 25 1010, Utility Monitoring and Controls System, Shop Drawings		D									NTP + 21 DAYS							
306	Section 25 1010, Utility Monitoring and Controls System, Product Data									D		NTP + 21 DAYS							
307	Section 25 1010, Utility Monitoring and Controls System, Design Data										D	NTP + 21 DAYS							
308	Section 25 1010, Utility Monitoring and Controls System, Test Report										D	NTP + 21 DAYS							
309	Section 25 1010, Utility Monitoring and Controls System, Operation and Maintenance Data										D	END OF CONTRACT							
	Division 26 - Electrical																		
310	Section 26 0100, General Items, Coordination Certification	D										NTP + 21 DAYS							

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311	Section 26 0519, Low-Voltage Electrical Power Conductors and Cables, Product Data									D		NTP + 21 DAYS							
312	Section 26 0519, Low-Voltage Electrical Power Conductors and Cables, Field Quailty Control Reports										D	NTP + 21 DAYS							
313	Section 26 0526, Grounding and Bonding for Electircal Systems, Product Data									D		NTP + 21 DAYS							
314	Section 26 0526, Grounding and Bonding for Electircal Systems, Field Qualty Control Reports										D	NTP + 21 DAYS							
315	Section 26 0529, Hangers and Supports for Electrical Systems, Product Data									D		NTP + 21 DAYS							
316	Section 26 0529, Hangers and Supports for Electrical Systems, Shop Drawings		D									NTP + 21 DAYS							
317	Section 26 0529, Hangers and Supports for Electrical Systems, Welding Certificates	D										NTP + 21 DAYS							
318	Section 26 0533, Raceways and Boxes, Product Data									D		NTP + 21 DAYS							
319	Section 26 0533, Raceways and Boxes, Shop Drawings		D									NTP + 21 DAYS							
320	Section 26 0533, Raceways and Boxes, Coordination Drawings		D									NTP + 21 DAYS							
321	Section 26 0543, Underground Ducts and Raceways for Electrical, Product Data									D		NTP + 21 DAYS							
322	Section 26 0543, Underground Ducts and Raceways for Electrical, Shop Drawings		D									NTP + 21 DAYS							
323	Section 26 0543, Underground Ducts and Raceways for Electrical, Coordination Drawings		D									NTP + 21 DAYS							
324	Section 26 0543, Underground Ducts and Raceways for Electrical, Certificates	D										NTP + 21 DAYS							
325	Section 26 0543, Underground Ducts and Raceways for Electrical, Qualifications	D										NTP + 21 DAYS							
326	Section 26 0543, Underground Ducts and Raceways for Electrical, Quality Control Reports										D	NTP + 21 DAYS							
327	Section 26 0544, Sleeves and Sleeve Seals for Electrical Raceways and Cabling, Product Data									D		NTP + 21 DAYS							
328	Section 26 0544, Sleeves and Sleeve Seals for Electrical Raceways and Cabling, Sustainability Submittals										D	NTP + 21 DAYS							
329	Section 26 0553, Identification for Electrical Systems, Product Data									D		NTP + 21 DAYS							
330	Section 26 0800, Apparatus Inspection and Testing, Test Reports										D	NTP + 21 DAYS							
331	Section 26 0800, Apparatus Inspection and Testing, Certificates	D										NTP + 21 DAYS							
332	Section 26 0800, Apparatus Inspection and Testing, Testing Agency Qualification	D										NTP + 21 DAYS							
333	Section 26 0923, Lighting Control System, Shop Drawings		D									NTP + 21 DAYS							
334	Section 26 0923, Lighting Control System, Product Data									D		NTP + 21 DAYS							
335	Section 26 1219, Three Phase Pad Mounted Transformers, Shop Drawings		D									NTP + 21 DAYS							
336	Section 26 1219, Three Phase Pad Mounted Transformers, Product Data									D		NTP + 21 DAYS							

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															APPROVED	DIS-APPROVED			
337	Section 26 1219, Three Phase Pad Mounted Transformers, Test Reports										D	NTP + 21 DAYS							
338	Section 26 1219, Three Phase Pad Mounted Transformers, Certificate	D										NTP + 21 DAYS							
339	Section 26 1219, Three Phase Pad Mounted Transformers, Manufacturer's Field Reports					D						NTP + 21 DAYS							
340	Section 26 1219, Three Phase Pad Mounted Transformers, Operation and Maintenance Data								D			NTP + 21 DAYS							
341	Section 26 2000, Interior Distribution System, Shop Drawings		D									NTP + 21 DAYS							
342	Section 26 2000, Interior Distribution System, Product Data									D		NTP + 21 DAYS							
343	Section 26 2000, Interior Distribution System, Test Reports										D	NTP + 21 DAYS							
344	Section 26 2000, Interior Distribution System, Manufacturer's Field Reports										D	NTP + 21 DAYS							
345	Section 26 2000, Interior Distribution System, Operation and Maintenance Data								D			NTP + 21 DAYS							
346	Section 26 2416, Panelboards, Product Data									D		NTP + 21 DAYS							
347	Section 26 2416, Panelboards, Shop Drawings		D									NTP + 21 DAYS							
348	Section 26 2416, Panelboards, Certificates	D										NTP + 21 DAYS							
349	Section 26 2416, Panelboards, Field Quality Control Reports										D	NTP + 21 DAYS							
350	Section 26 2416, Panelboards, Panelboard Schedules		D									NTP + 21 DAYS							
351	Section 26 2416, Panelboards, Operation and Maintenance Data								D			NTP + 21 DAYS							
352	Section 26 2418, Low-Voltage Transformers, Product Data									D		NTP + 21 DAYS							
353	Section 26 2418, Low-Voltage Transformers, Shop Drawings		D									NTP + 21 DAYS							
354	Section 26 2418, Low-Voltage Transformers, Certificates	D										NTP + 21 DAYS							
355	Section 26 2418, Low-Voltage Transformers, Field Quality Contraol Report										D	NTP + 21 DAYS							
356	Section 26 2418, Low-Voltage Transformers, Operation and Maintenance								D			NTP + 21 DAYS							
357	Section 26 2727, Wiring Devices, Product Data									D		NTP + 21 DAYS							
358	Section 26 2727, Wiring Devices, Shop Drawings		D									NTP + 21 DAYS							
359	Section 26 2727, Wiring Devices, Field Quality Control Reports										D	NTP + 21 DAYS							
360	Section 26 2727, Wiring Devices, Operation and Mainteance Data								D			NTP + 21 DAYS							
361	Section 26 2801, Coordinated Power Systems Protection, Product Data									D		NTP + 21 DAYS							
362	Section 26 2801, Coordinated Power Systems Protection, Test Report										D	NTP + 21 DAYS							
363	Section 26 2801, Coordinated Power Systems Protection, System Coordinator Qualifications										D	NTP + 21 DAYS							
364	Section 26 2801, Coordinated Power Systems Protection, System Installer Qualifications										D	NTP + 21 DAYS							
365	Section 26 2813, Fuses, Product Data									D		NTP + 21 DAYS							
366	Section 26 2813, Fuses, Operation and Maintenance Data								D			NTP + 21 DAYS							
367	Section 26 2816, Enclosed Switches and Circuit Breakers, Product Data									D		NTP + 21 DAYS							

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															APPROVED	DIS-APPROVED			
368	Section 26 2816, Enclosed Switches and Circuit Breakers, Shop Drawings		D									NTP + 21 DAYS							
369	Section 26 2816, Enclosed Switches and Circuit Breakers, Certificates	D										NTP + 21 DAYS							
370	Section 26 2816, Enclosed Switches and Circuit Breakers, Field Quality Control Reports										D	NTP + 21 DAYS							
371	Section 26 2816, Enclosed Switches and Circuit Breakers, Operation and Maintenance Data								D			NTP + 21 DAYS							
372	Section 26 3000, Short-Circuit/Coordination Study/Arc Flash Hazard Analysis, Study		D									NTP + 21 DAYS							
373	Section 26 3000, Short-Circuit/Coordination Study/Arc Flash Hazard Analysis, Final Report										D	NTP + 21 DAYS							
374	Section 26 4100, Lightning Protection Systems, Shop Drawings		D									NTP + 21 DAYS							
375	Section 26 4100, Lightning Protection Systems, Test Reports										D	NTP + 21 DAYS							
376	Section 26 4100, Lightning Protection Systems, Certificates	D										NTP + 21 DAYS							
377	Section 26 4113, Lighting Protection for Structures, Product Data									D		NTP + 21 DAYS							
378	Section 26 4113, Lighting Protection for Structures, Shop Drawings		D									NTP + 21 DAYS							
379	Section 26 4113, Lighting Protection for Structures, Field Quality Control Reports										D	NTP + 21 DAYS							
380	Section 26 4113, Lighting Protection for Structures, Certifications	D										NTP + 21 DAYS							
381	Section 26 5100, Interior Lighting, Shop Drawings		D									NTP + 21 DAYS							
382	Section 26 5100, Interior Lighting, Product Data									D		NTP + 21 DAYS							
383	Section 26 5100, Interior Lighting, Test Reports										D	NTP + 21 DAYS							
384	Section 26 5100, Interior Lighting, Certificates	D										NTP + 21 DAYS							
385	Section 26 5119, LED Interior Lighting, Product Data									D		NTP + 21 DAYS							
386	Section 26 5119, LED Interior Lighting, Schedule		D									NTP + 21 DAYS							
387	Section 26 5119, LED Interior Lighting, Anchorage Devices									D		NTP + 21 DAYS							
388	Section 26 5119, LED Interior Lighting, Certificates	D										NTP + 21 DAYS							
389	Section 26 5119, LED Interior Lighting, Test Reports										D	NTP + 21 DAYS							
390	Section 26 5119, LED Interior Lighting, Operation and Maintenance Data								D			NTP + 21 DAYS							
391	Section 26 5619, LED Exterior Lighting, Product Data									D		NTP + 21 DAYS							
392	Section 26 5619, LED Exterior Lighting, Schedule		D									NTP + 21 DAYS							
393	Section 26 5619, LED Exterior Lighting, Qualification Data	D										NTP + 21 DAYS							
394	Section 26 5619, LED Exterior Lighting, Certificates	D										NTP + 21 DAYS							
395	Section 26 5619, LED Exterior Lighting, Test Report										D	NTP + 21 DAYS							
396	Section 26 5619, LED Exterior Lighting, Quality Control Reports										D	NTP + 21 DAYS							
397	Section 26 5619, LED Exterior Lighting,Sample Warranty						3					NTP + 21 DAYS							
398	Section 26 5619, LED Exterior Lighting, Operation and Maintenance Data								D			NTP + 21 DAYS							
	Division 27 - Communications											NTP + 21 DAYS							

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															APPROVED	DIS-APPROVED			
399	Section 27 0500, Structured Cabling, Product Data									D		NTP + 21 DAYS							
400	Section 27 0510, Grounding and Bonding for Communication Systems, Product Data									D		NTP + 21 DAYS							
401	Section 27 0520, Communications Cable Management and Ladder Rack, Product Data									D		NTP + 21 DAYS							
402	Section 27 0528, Pathways for Communications Systems, Product Data									D		NTP + 21 DAYS							
403	Section 27 0544, Sleeves and Sleeve Seals for Communications Pathways and Cabling, Product Data									D		NTP + 21 DAYS							
404	Section 27 0544, Sleeves and Sleeve Seals for Communications Pathways and Cabling, Sustainability Submittals										D	NTP + 21 DAYS							
405	Section 27 1000, Building Telecommunications Cabling Systems, Shop Drawings		D									NTP + 21 DAYS							
406	Section 27 1000, Building Telecommunications Cabling Systems, Product Data									D		NTP + 21 DAYS							
407	Section 27 1000, Building Telecommunications Cabling Systems, Test Reports										D	NTP + 21 DAYS							
408	Section 27 1000, Building Telecommunications Cabling Systems, Certificates	D										NTP + 21 DAYS							
409	Section 27 1000, Building Telecommunications Cabling Systems, Manufacturer's Field Reports										D	NTP + 21 DAYS							
410	Section 27 1000, Building Telecommunications Cabling Systems, Operation and Maintenance Data								D			NTP + 21 DAYS							
411	Section 27 1000, Building Telecommunications Cabling Systems, Closeout Submittals										D	NTP + 21 DAYS							
412	Section 27 1000, Building Telecommunications Cabling Systems, Contractor's Qualifications										D	NTP + 21 DAYS							
413	Section 27 1300, Communications Optical Fiber Backbone Cabling, Product Data									D		NTP + 21 DAYS							
414	Section 27 1500, Communications Copper Horizontal Cabling, Product Data									D		NTP + 21 DAYS							
415	Section 27 2005, Communications and Fiber Optic Enclosures, Product Data									D		NTP + 21 DAYS							
416	Section 27 2010, Communications Racks and Enclosures, Product Data									D		NTP + 21 DAYS							
417	Section 27 2015, Communications Faceplates and Connectors, Product Data									D		NTP + 21 DAYS							
418	Section 27 2020, Communications Patch Cords and Workstation Cords, Product Data									D		NTP + 21 DAYS							
	Division 28 - Electrical Safety and Security																		
419	Section 28 3176, Interior Fire Alarm and Mass Notification System, Shop Drawings		D									NTP + 21 DAYS							
420	Section 28 3176, Interior Fire Alarm and Mass Notification System, Product Data									D		NTP + 21 DAYS							
421	Section 28 3176, Interior Fire Alarm and Mass Notification System, Design Data										D	NTP + 21 DAYS							
422	Section 28 3176, Interior Fire Alarm and Mass Notification System, Test Reports										D	NTP + 21 DAYS							
423	Section 28 3176, Interior Fire Alarm and Mass Notification System, Certificates	D										NTP + 21 DAYS							

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															APPROVED	DIS-APPROVED			
424	Section 28 3176, Interior Fire Alarm and Mass Notification System, Manufacturer's Field Reports										D	NTP + 21 DAYS							
425	Section 28 3176, Interior Fire Alarm and Mass Notification System, Operation and Maintenance Data								D			NTP + 21 DAYS							
426	Section 28 3176, Interior Fire Alarm and Mass Notification System, Closeout Submittals										D	END OF CONTRACT							
	Division 31 - Earthwork																		
427	Section 31 0200, Temporary Erosion and Sediment Control, Certificate	D										NTP + 21 DAYS							
428	Section 31 0200, Temporary Erosion and Sediment Control, Inspection Report										D	NTP + 21 DAYS							
429	Section 31 0200, Temporary Erosion and Sediment Control, Sustainability Submittal										D	NTP + 21 DAYS							
430	Section 31 2210, Earthwork, Material Test Reports										D	NTP + 21 DAYS							
	Division 32 - Exterior Improvments																		
431	Section 32 1314, Cement Concrete Paving, Product Data									D		NTP + 21 DAYS							
432	Section 32 1314, Cement Concrete Paving, Design Mixes									D		NTP + 21 DAYS							
433	Section 32 1314, Cement Concrete Paving, Test Reports										D	NTP + 21 DAYS							
434	Section 32 1314, Cement Concrete Paving, Certificates	D										NTP + 21 DAYS							
435	Section 32 1314, Cement Concrete Paving, Sustainability Submittals										D	NTP + 21 DAYS							
436	Section 32 1720, Pavement Joint Sealants, Product Certificates	D										NTP + 21 DAYS							
	Division 33 - Utilities																		
437	Section 33 1117, Outside Water System, Product Data									D		NTP + 21 DAYS							
438	Section 33 13112, Sanitary Sewer, Sustainability Submittals										D	NTP + 21 DAYS							
439	Section 33 170, UL Listed Oil/Water Seperator, Shop Drawings		D									NTP + 21 DAYS							
440	Section 33 170, UL Listed Oil/Water Seperator, Product Data									D		NTP + 21 DAYS							
441	Section 33 170, UL Listed Oil/Water Seperator, Operation and Maintenance Data										D	NTP + 21 DAYS							
442	Section 33 13112, Sanitary Sewer, Test Reports										D	NTP + 21 DAYS							
443	Section 33 4112, Storm Drainage, Product Data									D		NTP + 21 DAYS							
444	Section 33 4112, Storm Drainage, Sustainability Submittal										D	NTP + 21 DAYS							

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SECTION 013225 - PROJECT SUSTAINABILITY SUMMARY

PART 1 GENERAL

1.01 PROJECT GOALS

A. This project has been designed for, and must be constructed to attain a sustainability rating of GBCI GP TPC Assessment as defined in UFC 01-200-02 - High Performance Sustainable Building Requirements, With Change 4.

B. This project is pursuing the following critera:

1. Commissioning

   a. Submit approved Final Commissioning Report required by Section 01 9100.15 - Total Building Commissioning as proof of this tracking requirement.

2. Energy Efficient Products

   a. Provide only energy-using products that are Energy Star rated, or have the Federal Energy Management Program (FEMP) recommended efficiency. Where Energy Star or FEMP recommendations have not been established, provide most efficient products that are life-cycle cost effective.

      Provide only energy using products that meet FEMP requirements for low standby power consumption. Energy efficient products can be found at: https://energy.gov/eere/femp/federal-energy-management-program and https://www.energystar.gov/. Provide the following documentation:

      1) Proof that products are labeled energy efficient and comply with the cited requirements.

3. Indoor Water Use

   a. Provide only water-consuming products that are EPA WaterSense labeled, or the most efficient water fixtures available that meet the requirements of ASHRAE 189.1 Section 6.3.2, when EPA WaterSense products are not available. Provide the following documentation:

   b. For products available with EPA WaterSense labeling, proof that fixtures are labeled EPA WaterSense or Energy Star; for all other fixtures, proof they comply with the cited efficiency requirements.

4. Reduce Volatile Organic Compounds (VOC) (Low Emitting Materials)

   a. Meet the requirements of ASHRAE 189.1 section 8.4.2.

b. Provide certifications or labels that demonstrate compliance with cited requirements.

5. Indoor Air Quality During Construction

a. Prior to construction, create indoor air quality (IAQ) plan. Develop and implement the IAQ construction management plan during construction and flush building air before occupancy.

b. For new construction of buildings, indoor air quality plan must meet the requirements of ASHRAE 189.1 Section 10.3.1.4. (Indoor Air Quality (IAQ) Construction Management), with maximum outdoor air consistent with achieving relative humidity no greater than 60 percent

c. Provide documentation showing that after construction ends and prior to occupancy, HVAC filters were replaced and building air was flushed out in accordance with the cited standard.

6. Recycled Content

a. Comply with 40 CFR 247. Refer to https://www.epa.gov/smm/comprehensive-procurement-guideline-cpg-program for assistance identifying products cited in 40 CFR 247. Selected products must comply with non-proprietary requirements of the Federal Acquisition Regulation, and must meet performance requirements. Provide the following documentation:

1) Manufacturers' documents stating the recycled content by material, or written justification for claiming one of the exceptions allowed on the cited website.

2) Substitutions: Submit for Government approval in accordance with Section 01 6300 - Product Options and Substitutions.

7. Bio-Based Products

a. Provide products and material composed of the highest percentage of biobased materials (including rapidly renewable resources and certified sustainably harvested products), consistent with FSRIA 9002 USDA BioPreferred Program, to the maximum extent possible without jeopardizing the intended end use or detracting from the overall quality delivered to the end user. Use only supplies and materials of a type and quality that conform to applicable specifications and standards.

b. Comply with FSRIA 9002 USDA BioPreferred Program. Refer to https://www.biopreferred.gov/BioPreferred/ for the product categories and BioPreferred Catalog. Selected products must comply with non-proprietary requirements of the Federal Acquisition Regulation, and must meet performance requirements. Provide the following documentation:

1) USDA BioPreferred label for each product; for bio-based products used on project but not listed with BioPreferred program, provide bio-based content and percentage.

2) In order to complete compliance with FAR 52.223-2 Affirmative Procurement of Biobased Products Under Service and Construction Contracts, refer to submittal requirement for biobased products in Section 01 78 00.

8. Waste Material Management (Recycling – Construction)

a. Divert construction debris from landfill disposal where markets or on-site recycling exists, and provide documentation in accordance with Section 01 74 19 - Construction Waste Management and Disposal.

1.02 RELATED REQUIREMENTS

A. Section 01 3329 - Sustainable Design Reporting

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

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SECTION 013329 - SUSTAINABLE DESIGN REPORTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General requirements for sustainable design reporting.

1. The project intends to be constructed using procedures and documentation complying with the federally mandated "Guiding Principles" (GP), Third Party Certification (TPC) requirements (if applicable), UFC 1-200-02, High Performance and Sustainable Building Requirements, and other requirements identified in this specification.

B. Refer to TPC Checklist at the end of this specification section for each project.

1.02 REPORTING REQUIREMENTS

A. Free-standing furniture and furnishings are not included in the Contract.

B. Contractor must familiarize himself with the relevant reporting requirements and provide the necessary information and instruction to all subcontractors and installers.

C. Third Party Certification (TPC) Documentation

1. The project has been designed for, and must be constructed to attain a sustainability rating of GBCI GP TPC Assessment. Project is already registered with the TPC Organization. Provide construction related sustainability documentation, in the format required by the TPC Organization, to the Government for approval, and for final approval by the TPC organization. Third Party Certification is met when Government receives TPC organization certificate, assessment, or validation and plaque. Execute the following:

a. Refer to TPC Checklist at the end of this specification section for each project.

b. Immediately bring to the attention of the Government any project changes that impact meeting the approved TPC Requirements for this project.

c. Complete all work required to incorporate the applicable TPC Requirements.

d. Maintain the construction related information, and provide replacement pages, in the Sustainability eNotebook pertaining to additions and changes to the approved sustainability requirements. Maintain the Sustainability eNotebook in electronic format. For more explanation, refer to paragraph SUSTAINABILITY eNOTEBOOK. Provide the following components in the

Sustainability eNotebook for each project:

1) TPC Checklist

   (a) Completed TPC documentation for each identified requirement. Forward to the Government for approval.

2) Provide the following information in the Sustainability Action Plan.

   (a) Planned method to achieve each TPC requirement.

   (b) For each TPC requirement that is attempted but not achieved, provide narrative explaining how mission or activity precludes achieving specific sustainability requirement or goal. Provide analysis of particular requirement and level to which project is able to comply.

   (c) Provide name and contact information for: Sustainability Point of Contact (POC) and other names of sustainability professionals responsible for ensuring TPC sustainability goals are accomplished and documentation is assembled.

3) Bear all costs associated with constructing, demonstrating, and documenting that project complies with approved TPC requirements, including but not limited to:

   (a) TPC coordination with Government's AE and other consultants, TPC website requirements, and management for construction related documentation.

   (b) Construction work required to incorporate TPC requirements.

   (c) Submittals required to demonstrating compliance with Government approved TPC checklists.

   (d) Documentation illustrating compliance with TPC requirements and additional documentation required by the TPC.

4) Provide all calculations, product data, and certifications, assessments, or validations required in this contract to demonstrate compliance with the TPC Requirements of this section.

1.03 RELATED REQUIREMENTS

A. Section 01 3001 - Submittals for submittal requirements.

B. Section 01 3325 - Project Sustainability Summary

C. Section 016000 - Product Requirements.

D. Section 016116 - Volatile Organic Compound (VOC) Content Restrictions.

E. Section 017419 - Construction Waste Management and Disposal.

1.04 DEFINITIONS

A. Definitions in this Article are in addition to sustainable design definitions directly related to products, as listed in Section - 016000 - Product Requirements.

B. Indoor Air Quality (IAQ) Management Plan: Plan developed by the Contractor to provide a healthy indoor environment for workers and building occupants during construction. Plan must meet or exceed the recommendations of SMACNA (OCC) 'IAQ Guidelines for Occupied Buildings Under Construction'.

C. Life Cycle Assessment (LCA): Compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its life cycle.

D. Material Cost: The dollar value of materials being provided to the site, after Contractor mark-ups, including transportation costs, taxes, fees, and shop labor, but excluding field equipment and field labor costs.

1.05 PRODUCT REPORTING SCOPE

A. General: Product reporting scope for the purpose of achieving the selected sustainability certification level is limited to those items directly affecting ability to achieve targeted credits.

1.06 REFERENCE STANDARDS

A. SMACNA (OCC) - IAQ Guidelines for Occupied Buildings Under Construction 2007.

B. HPSB Guiding Principles - Guiding Principles for Sustainable Federal Buildings and Determing Compliance with the Guiding Principles for Susainable Federal Buildings

C. UFC 01-200-02 - High Performance Sustainable Building Requirements, With Change 4

D. ASHRAE 189.1 - Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings

E. Energy Star - Energy Star Energy Efficience Labeling System (FEMP)

F. GBCI GP Assessment - Guiding Principles Assessment by GBCI (DOD Version)

G. ASHRAE 189.1 - American Society of Heating, Refrigerating and Air-Conditioning Engineers

H. 10 CFR 433.300 - Subpart C - Green Building Certification for Federal Buildings

I. 40 CFR 247 - Comprehensive Procurement Guideline for Products Containing Recovered Materials

1.07 SUBMITTALS

A. See Section 01 3001 - Submittals for additional submittal requirements

B. Sustainable Design Documentation: The scope of required documentation is specified in this section and in applicable individual specification sections.

C. High Performance Sustainabile Building Requirements - Documentation is required for, but not limited to, the following items for each project:

1. High Performance Sustainable Building (HPSB) Checklist

   a. Provide construction documentation that provides proof of and supports compliance with the completed HPSB Checklist.

2. Sustainability eNotebook

   a. The Sustainability eNotebook is an electronic organizational file that serves as a repository for all required sustainability submittals. To support documentation of compliance with an approved TPC checklist, provide and maintain a comprehensive and current Sustainability eNotebook

      Sustainability eNotebook must contain all required data to support full compliance with the HPSB Guiding Principles Requirements, including:

      1) HPSB checklist

      2) Sustainable Action Plan

      3) Calculations

      4) Labels

      5) Submittals (sustainability documentation requirements)

      6) Certifications, assessments, or validations

7) TPC documentation required in paragraph THIRD PARTY CERTIFICATION (TPC) above.

b. Provide sustainability eNotebook in the form of an Adobe PDF file; bookmark each HPSB Guiding Principles Requirement , TPC requirement,and sub-bookmark at each document. Match format to HPSB Guiding Principles numbering system indicated herein. Maintain up-to-date information, spreadsheets, templates, and other required documentation with each current submittal. For TPC projects, provide a second Table of contents using TPC numbering system, for maintaining documentation unique to TPC.

c. Contracting Officer may deduct from the monthly progress payment accordingly if Sustainability eNotebook information is not current, until information is updated and on track per project goals.

3. Sustainability eNotebook Submittal Schedule

a. Provide Sustainability eNotebook Submittals at the following milestones of the project:

1) Preliminary Sustainability eNotebook

(a) Submit preliminary Sustainability eNotebook for approval at the Pre-construction conference. Include Preliminary TPC checklist.

2) Final Sustainability eNotebook

(a) Provide up-to-date Sustainability eNotebook at the Beneficial Occupancy Date (BOD). Final progress payment retainage may be held by Contracting Officer until final sustainability documentation is complete.Include Final High Performance and Sustainable Building Checklist.

3) Amended Final Sustainability eNotebook

(a) Amend and resubmit the Final Sustainability eNotebook to include post-occupancy corrections, updates, and requirements. Include Amended Final High Performance and Sustainable Building Checklist.

(b) Final progress payment retainage may be held by Contracting Officer until amended final sustainability documentation is complete. Submit final electronic copies of the Amended Final Sustainability eNotebook Submittal on DVDs to the Government no longer than 30

days after the GP, TPC designated data collection period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROCEDURES

A. Submit sustainable design documentation required of the Contractor, using procedures defined under Submittals for Information in Section 01 3001.

B. Submit sustainable design documentation to Architect, unless otherwise indicated.

C. Where an item of sustainable design documentation is specified, fill out and submit electronically the appropriate form(s), and/or use appropriate software.

   1. Fill out one line for each different brand name product and each different manufacturer of a lot of commodity products.

   2. Where required attachments are specified, attach the documentation.

D. Each form must be signed by the entity capable of certifying the information.

   1. Certification signatures must be made by an officer of the company.

   2. For products, certification must be made by the manufacturer not the supplier.

   3. For custom fabricated products, certification by the fabricator is acceptable.

E. Submit the completed forms in accordance with the requirements of Section 01 3001, as information submittals.

   1. Give each form a unique submittal number.

   2. Do not combine sustainable design documentation with product data or shop drawing submittals.

END OF SECTION

Air National Guard Sustainability Requirements Scoresheet

HPSB COMPLIANCE (2017v1) (Updated April 2017)

* required entry

General Information

Federal Requirements Complete

FAKZ182357	Project # (e.g. ABCD12345)
F-35: Convert Bldg 1407 for AGE Facility	Project Title
TBD	Facility Number
TBD	Real Property Unique ID (RPUID)
Montgomery Regional Airport (ANG) Base	Installation
FAKZ	Installation Code
Montgomery	City
AL	State
Andari, Imad	NGB A4O Project Manager (Last Name, First Name)
$3,200,000	PA ($000)
17,524.00	Building Size (SF)
FY2022	Program Year (FY####)
Seay Seay & Litchfield	Design - AE
B3 100%	Project Phase
09/17/21	Design Started (MM/DD/YY)
TBD	BOD (MM/DD/YY)
1000152393	Green Business Certification Incorporated (GBCI) Registration Number
	12/7/2021 Date Project Registered (MM/DD/YY)
	Date Project Certified (MM/DD/YY)
26	Federal Requirements - Yes or N/A
1	Federal Requirements - No
96%	HPSB Compliant
47%	Energy Efficiency Achieved (% below ANSI/ASHRAE/IESNA Standard 90.1-2013)
Apr-23	Date Scoresheet completed
2017V1	Scoresheet version

Air National Guard Sustainability Requirements Scoresheet

HPSB COMPLIANCE (2017v1) (Updated April 2017)

* required entry

Color Coding: See Instructions Tab for more detail	
Drop-Down Box	Yes or N/A
No Entry Required	No
Custom Entry	Recommended not Required

90.1-2013

HPSB I: Employ Integrated Design Principles (UFC 1-200-02 para 2-2)

Total Points 2 — Possible Points 2

Yes	HPSB I.1	**Integrated Design**	1
Yes	HPSB I.2	**Commissioning**	1

HPSB II: Optimize Energy Performance (UFC 1-200-02 para 2-3)

Total Points 5 — Possible Points 5

Yes	HPSB II.1	**Energy Efficiency**		1
		Yes	Reduce energy use 30% below ANSI/ASHRAE/IESNA Standard 90.1-2013 or IECC, or if not - achieve maximum energy efficiency that is lifecycle cost effective	
		46.5%	Insert percentage below ANSI/ASHRAE/IESNA Standard 90.1-2013 or IECC, in terms of energy use (e.g. 32)	
		29.5	Insert building energy intensity (kBtu/yr-sqft) calculated IAW 10 CFR 433	
		Yes	Roof Attributes (Recommended)	
		1	Select roof types (Check below)	
			☑ Cool roof ☐ Solar electric ☐ Solar Passive ☐ Green roof ☐ Solar thermal	
		Energy Efficient Products		1
		Yes		
Yes	HPSB II.2	**On-site Renewable Energy**		1
		Yes	Installed renewable energy elements or projects were not lifecycle cost effective	
		1	Renewable energy types (check below)	
			☐ Solar PV ☐ Geothermal ☐ Hydro ☐ Waste to Energy ☐ Solar CP ☐ GSHP ☐ Wind ☑ Renewables were not lifecycle cost effective ☐ Solar Thermal Electric	
		0.0	Insert generation capacity (kW)	
		0.0%	Insert percentage of total building	
Yes	HPSB II.3	**On-site Renewable Energy - Solar Hot Water Heater System**		1
		Yes	Installed solar hot water heater system or found installation not lifecycle cost effective	
		0.0	Insert generation capacity (MMBtu/yr)	
		0.0%	Insert percentage of demand	
Yes	HPSB II.4	**Metering**		1
		Yes	Electric Metering: Select N/A if no service	
		Yes	Natural Gas Metering: Select N/A if no service	
		N/A	Steam Metering: Select N/A if no service	

HPSB III: Protect and Conserve Water (UFC 1-200-02 para 2-4)

Total Points 5 — Possible Points 6

Yes	HPSB III.1	**Indoor Water**		1
Yes		**Indoor Water Metering**		1
Yes	HPSB III.2	**Outdoor Water**		1
Yes		**Outdoor Water Metering**		1
No	HPSB III.3	**Alternative Water**		1
Yes	HPSB III.4	**Stormwater Management (LID Documentation per UFC 3-210-10)**		1
		0.0	Change in Impervious Area (SF)	
		$0.00	Pre-Award Cost Estimate ($)	
		Yes	Project addressed EISA 438	
		1	EISA Technical Constraints	
			☐ Retaining stormwater impact receving water flow ☐ Shallow bedrock, contaminated soil, high ground water table, underground utilities ☐ Soil infiltration capacity limited ☐ Site too small to infiltrate significant volume ☐ Non-potable water demand to small ☐ Structural, plumbing, and other mods not feasible ☐ State or local restrict water harvesting ☐ State or local restrict use of green infrastructure or LID ☑ Other	
		0.0%	Percent Increase in Stormwater Runoff for 95 Percentile Storm (%) -or- Percent Increase in Stormwater Runoff from continuous simulation model, published data, studies, or other established tools (Reference UFC 3-210-10 Figure 2-1 Implementation of EISA Section 438)	
		Both	LID Features Locations	
		0	Integrated Management Practices Employed	

Air National Guard Sustainability Requirements Scoresheet

HPSB COMPLIANCE (2017v1) (Updated April 2017)

* required entry

- ☐ Bio-Retention
- ☐ Dry Wells
- ☐ Filter Strips
- ☐ Grassed Swells
- ☐ Infiltration Trench
- ☐ Inlet Pollution Removal Device
- ☐ Permeable Pavement/Pavers
- ☐ Rain Barrels/Cisterns
- ☐ Soil Amendments
- ☐ Tree Box Filters
- ☐ Vegetated Buffers
- ☐ Vegetated Roof
- ☐ Other

$0.00	Final LID Construction Cost ($)
NA	Post Construction Analysis (Name of DOR)

HPSB IV: Enhance Indoor Environmental Quality (UFC 1-200-02 para 2-5)				
Total Points	**8**		Possible Points	8
Yes	HPSB IV.1	**Thermal Comfort**		1
Yes	HPSB IV.2	**Ventilation**		1
Yes	HPSB IV.3	**Daylighting**		1
Yes	HPSB IV.4	**Moisture Control**		1
Yes	HPSB IV.5	**Low Emitting Materials**		1
Yes	HPSB IV.6	**Protect Indoor Air Quality during Construction**		1
Yes	HPSB IV.7	**Environmental Tobacco Smoke Control**		1
Yes	HPSB IV.8	**Occupant Health and Wellness**		1
HPSB V: Reduce Environmental Impact of Materials (UFC 1-200-02 para 2-6)				
Total Points	**5**		Possible Points	5
Yes	HPSB V.1	**Recycled Content**		1
N/A	HPSB V.2	**Biologically-based Products**		1
Yes	HPSB V.3	**Ozone Depleting Substances**		1
Yes	HPSB V.4	**Waste and Materials Management - Recycling**		1
Yes	HPSB V.5	**Waste and Materials Management - Divert 60% from Disposal**		1
		Yes	60% or greater diverted	
		60.0%	Insert percentage diverted from landfill	
HPSB VI: Address Climate Change Risk (UFC 1-200-02 para 2-7)				
Total Points	**1**		Possible Points	1
Yes	HPSB VI.1	**Address Climate Change Risk**		1
			Possible Points	**27**
26	**Federal Requirements - Yes or N/A**			
1	**Federal Requirements - No**			
96%	**Percentage of Federal Requirements Met**			

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SECTION 013553 - SECURITY PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Security measures including entry control, personnel identification, miscellaneous restrictions, and miscellaneous provisions.

1.02 RELATED REQUIREMENTS

A. 01 0102 - Project Information & Summary

1.03 ENTRY CONTROL

A. The contractor shall comply with all applicable installation/facility access and local security policies and procedures.

B. Unscheduled gate closures by the Security Police may occur at any time causing all personnel entering or exiting a closed installation to experience a delay.

C. The Contractor shall allow entrance to the Project site only to persons who have received approval by Base Security Forces.

1.04 PERSONNEL IDENTIFICATION

A. The Government will issue personnel identification for all Contractor and Subcontractor personnel needing access to the site.

B. The Contractor shall provide all information required for background checks to meet installation access requirements.

C. Information required for background checks shall be provided in ample time for review by base personnel and coordinated with the proposed schedule of the work. Delay is approval, or refusal of entry, of Contractor and/or Subcontractor personnel by Base Security Forces shall not affect completion of the Work within the stipulated contract duration. No modifications in Contract Time will be considered based upon delay in approval and/or refusal of entry of Contractor and/or Subcontractor personnel by Base Security Forces.

D. All Contractor's personnel shall display the Base issued Contractor identification badge at all times while present on site.

E. Comply with the Government's requirements for return and/or disposal of badges at expiration of Contractor's employment on the Work.

1.05 MISCELLANEOUS PROVISIONS

A. When operating on USAF Installations, in accordance with, AFI 10-701, Operations Security (OPSEC) Instructions. The Contractor will comply with DOD Force Protection Condition Measures, DOD Standard /Level I-AT Awareness Training, and associated tasking contained in AFI 10-245, Antiterrorism (AT) standards. Level I AT Awareness training is available for Contractor personnel and can be requested by the 187FW7 Base Contracting Offices

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Submittals.

B. Testing and inspection agencies and services.

C. Control of installation.

D. Mock-ups.

E. Manufacturers' field services.

F. Defect Assessment.

1.02 RELATED REQUIREMENTS

A. Section 01 3001 - Submittals

B. Section 016000 - Product Requirements: Requirements for material and product quality.

1.03 REFERENCE STANDARDS

A. ASTM C1077 - Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation 2017.

B. ASTM C1093 - Standard Practice for Accreditation of Testing Agencies for Masonry 2022a.

C. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction 2019.

1.04 SUBMITTALS

A. See Section 01 3001 - Submittals for submittal procedures.

B. Design Data: Submit for the Government's knowledge for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for the Government's information.

C. Report/Inspection Data: Written reports of each inspection, test or similar service shall include, but not be limited to:

1. Date of issue.
2. Project title and number.
3. Name, address and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making the inspection or test.
6. Designation of the Work and test method.
7. Identification of product and Specification Section.
8. Complete inspection or test data.
9. Test results and an interpretation of test results.
10. Ambient conditions at the time of sample-taking and testing.
11. Comments or professional opinion as to whether inspected or tested Work complies with Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting.
14. The independent testing agency shall submit a certified written report of each inspection, test or similar service, to the Government, in duplicate, unless the Contractor is responsible for the service. If the Contractor is responsible for the service, submit a certified written report of each inspection, test or similar service through the Contractor, in duplicate.
15. Submit additional copies of each written report directly to the governing authority, when the authority so directs.

D. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to the Government in quantities specified for Product Data.

1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
2. Certificates may be recent or previous test results on material or product, but must be acceptable to the Government.

E. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Government's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

F. Manufacturer's Field Reports: Submit reports for the Government's benefit.

1. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents.

G. Erection Drawings: Submit drawings for the Government's benefit.

1. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents.

1.05 TESTING AND INSPECTION AGENCIES AND SERVICES

A. Contractor shall employ and pay for services of an independent testing agency to perform other specified testing.

B. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

C. Contractor Responsibilities: The Contractor shall provide inspections, tests and similar quality control services, specified in individual Specification Sections and required by governing authorities; these services include those specified to be performed by an independent agency and not by the Contractor. Costs for these services shall be included in the Contract Sum.

D. Retesting: The Contractor is responsible for retesting where results of required inspections, tests or similar services prove unsatisfactory and do not indicate compliance with Contract Document requirements, regardless of whether the original test was the Contractor's responsibility.

1. Cost of retesting construction revised or replaced by the Contractor is the Contractor's responsibility, where required tests were performed on original construction.

E. Associated Services: The Contractor shall cooperate with agencies performing required inspections, tests and similar services and provide reasonable auxiliary services as requested. Notify the agency sufficiently in advance of operations to permit assignment of personnel. Auxiliary services required include but are not limited to:

1. Providing access to the Work and furnishing incidental labor and facilities necessary to facilitate inspections and tests.

2. Taking adequate quantities of representative samples of materials that require testing or assisting the agency in taking samples.

3. Providing facilities for storage and curing of test samples, and delivery of samples to testing laboratories.

4. Providing the agency with a preliminary design mix proposed for use for materials mixes that require control by the testing agency.

5. Security and protection of samples and test equipment at the Project site.

F. Lighting Protection: Contractor shall employ and pay services for a third-party inspector whose sole work is lighting protection. The Lighting Protection System shall be inspected prior to acceptance by a third-party inspector and shall be certified by this third-party inspector as compliant with AF132-1065 and NFPA 780, in that priority order. Reference UFC 3-575-01.

G. The Contractor shall employ a Qualified Fire Protection Engineer (QFPE) meeting the requirements of UFC 3-600-01. Refer to 00 0102 for additional information regarding the Contractor's QFPE.

PART 2 PRODUCTS - N/A

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from the Government before proceeding.

D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Have work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 MOCK-UPS

A. Tests shall be performed under provisions identified in this section and identified in the respective product specification sections.

B. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.

C. Accepted mock-ups shall be a comparison standard for the remaining Work.

D. Where mock-up has been accepted by the Government and is specified in product specification sections to be removed, protect mock-up throughout construction, remove mock-up and clear area when directed to do so by the Government.

3.03 TESTING AND INSPECTION

A. The contractor shall provide all testing, inspections, and similar services; these services also include those specified to be performed by an independent agency.

B. Testing Agency Duties:

1. Provide qualified personnel at site. Cooperate with Government and Contractor in performance of services.

2. Perform specified sampling and testing of products in accordance with specified standards.

3. Ascertain compliance of materials and mixes with requirements of Contract Documents.

4. Promptly notify the Government and Contractor of observed irregularities or non-compliance of Work or products.

5. Perform additional tests and inspections required by the Government.

6. Submit reports of all tests/inspections specified.

C. Limits on Testing/Inspection Agency Authority:

1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Agency may not approve or accept any portion of the Work.
3. Agency may not assume any duties of Contractor.
4. Agency has no authority to stop the Work.

D. Contractor Responsibilities:

1. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
2. Provide incidental labor and facilities:
   a. To provide access to Work to be tested/inspected.
   b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
   c. To facilitate tests/inspections.
   d. To provide storage and curing of test samples.
3. Notify Government and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
4. When required, employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
5. When required, arrange with the Government's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

E. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by the Government.

F. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

3.04 MANUFACTURERS' FIELD SERVICES

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site

conditions, conditions of surfaces and installation, quality of workmanshipstart-up of equipment,test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.

B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.05 DEFECT ASSESSMENT

A. Replace Work or portions of the Work not complying with specified requirements.

END OF SECTION

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SECTION 014100 - REGULATORY REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY OF REFERENCED STANDARDS

A. Regulatory requirements applicable to this project are the following:

1. All applicable National, State and Local Codes
2. Alabama State Fire Marshall
3. Dannelly Airfield Fire Department
4. Montgomery Regional Airport Master Plan Design Data
5. Americans with Disability Act Accessibility Guidelines (ADAAG), Current Edition
6. ICC/ANSI A117.1-2003 Design Guidelines for Accessible and Usable Building Facilities
7. OSHA
8. All Applicable Sections of the US Code of Federal Regulations
   a. 28 CFR 35 Department of Justice Accessibility Regulations Relating to State and Local Governments
      1) 28 CFR 36 Department of Justice Accessibility Regulations Relating to Public Accommodations.
      2) 29 CFR 1910 Occupational Safety and Health Standards
      3) 36 CFR 1191 Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.
   b. FED-STD-795 - Uniform Federal Accessibility Standards; 1988.
9. All applicable Engineering Technical Letters (ANGETL)
   a. ANGETL 15-01-00 ANG Design Policy
   b. ANGETL 15-01-02 SCIF and ATFP Guidance
   c. ANGETL 15-01-03 Fire Protection and Design

d. ANGETL 15-01-04 Mechanical Engineering

e. ANGETL 15-01-05 Electrical and Communications Engineering

f. ANGETL 15-01-06 Roof Design Guidance

10. Air National Guard Handbook (ANGH) 32-1084, Facility Space Standards

11. All Applicable Sections of the United Facilities Criteria

    a. Series 1:200; UFC 1-200-01, UFC 1-200-02

    b. Series 3-100: UFC 3-101-01, 3-110-03, 3-120-01, 3-120-10, 3-190-06

    c. Series 3-200: UFC 3-201-01, 3-250-01, 3-250-04, 3-250-08FA, 3-250-11

    d. Series 3-300: UFC 3-301-01

    e. Series 3-400: UFC 3-400-02, 3-401-01, 3-410-01, 3-410-02, 3-410-04, 3-420-01, 3-430-01FA, 3-420-02 FA, 3-450-01, 3-470-01

    f. Series 3-500: UFC 3-501-01, 3-520-01, 3-520-05, 3-530-01, 3-550-01, 3-570-01, 3-575-01, 3-580-01

    g. Series 3-600: UFC 3-600-01

    h. Series 4: UFC 4-010-01, 4-021-01

    i. Series 4-600: UFC 4-610-01

12. All National Fire Protection Association (NFPA) codes and standards referenced by Unified Facilities Criteria (UFC).

13. All model codes and standards developed by the International Code Council (ICC) referenced by Unified Facilities Criteria (UFC).

    a. International Building Code, edition referenced in applicable UFC.

        1) International Fire Code, edition referenced in applicable UFC.

        2) International Fuel Gas Code, edition referenced in applicable UFC.

        3) International Mechanical Code, edition referenced in applicable UFC.

        4) International Plumbing Code, edition referenced in applicable UFC.

        5) International Electrical Code, edition reference in applicable UFC.

14. F-35 Lightning II Facilities Requirements Document, Section 3: Operation Facility Requirements, Document No. 2PJG00001, Revision S, dated 11 November 2021.

    a. A copy of the listed document will be furnished to the awarded contractor following award.

15. GBCI Guiding Principles Assessment: Technical GuideNew Construction and Renovations Guiding Principles Implemented by UFC 1-200-02 (December 2016)

1.02 RELATED REQUIREMENTS

A. Section 014000 - Quality Requirements.

1.03 QUALITY ASSURANCE

A. Contractor's Designer Qualifications:

1. Refer to Section - 014000-Quality Requirements.

2. Where delegated engineering design is to be performed under the construction contract, provide the direct supervision of Professional Engineer experienced in the design of this type of work and licensed in the State of Alabama.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

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SECTION 014217 - DEFINITIONS AND STANDARDS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including Requirements of the Government's Solicitation and other Division 1 Specification Sections, apply to this Section.

1.02 DEFINITIONS

A. General: Basic Contract definitions are included in the General Conditions.

B. Indicated refers to graphic representations, notes or schedules on the Drawings, or other Paragraphs or Schedules in Specifications, and similar requirements in Contract Documents. Where terms such as "shown," "noted," "scheduled," and "specified" are used, it is to help locate the reference; no limitation on location is intended except as specifically noted.

C. Directed: Terms such as "directed", "requested", "authorized", "selected", "approved", "required", and "permitted" mean "directed by the Government", "requested by the Government", and similar phrases. However, no implied meaning shall be interpreted to extend the Government's responsibility into the Contractor's area of construction supervision.

D. A.D.A.--American Disabilities Act of July 26, 1991 and all revisions to date.

E. Approve: The term "approved," where used in conjunction with the Government's action on the Contractor's submittals, applications, and requests, is limited to the duties and responsibilities of the Government as stated in Solicitation Requirements. Such approval shall not release the Contractor from responsibility to fulfill Contract requirements unless otherwise provided in the Contract Documents.

F. Furnish: The term "furnish" is used to mean "supply and deliver to the Project site, ready for unloading, unpacking, assembly, installation, and similar operations."

G. Install: The term "install" is used to describe operations at project site including the actual "unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations."

H. Provide: The term "provide" means "to furnish and install, complete and ready for the intended use."

I. Installer: An "Installer" is the Contractor or an entity engaged by the Contractor, either as an employee, subcontractor, or sub-subcontractor for performance of a particular construction activity, including installation, erection, application, and similar operations. Installers are required to be experienced in the operations they are engaged to perform.

J. The term "experienced," when used with the term "Installer" means having a minimum of 5 previous Projects similar in size and scope to this Project, being familiar with the precautions required, and having complied with requirements of the authority having jurisdiction.

K. Project Site is the space available to the Contractor for performance of construction activities, either exclusively or in conjunction with others performing other construction activities as part of the Project. The extent of the Project Site is shown on the Drawings and may or may not be identical with the description of the land upon which the Project is to be built.

L. Testing Laboratories: A "testing laboratory" is an independent entity engaged to perform specific inspections or tests, either at the Project Site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

1.03 SPECIFICATION FORMAT AND CONTENT EXPLANATION

A. Specification Format: These Specifications are organized into Divisions and Sections based on the Construction Specifications Institute's format and MASTERFORMAT numbering system.

B. Specification Content: This Specification uses certain conventions in the use of language and the intended meaning of certain terms, words, and phrases when used in particular situations or circumstances. These conventions are explained as follows:

C. Abbreviated Language: Language used in the Specifications and other Contract Documents is the abbreviated type. Implied words and meanings will be appropriately interpreted. Singular words will be interpreted as plural and plural words interpreted as singular where applicable and where the full context of the Contract Documents so indicates.

D. Imperative and streamlined language is used generally in the Specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the text, for clarity, subjective language is used to describe responsibilities that must be fulfilled indirectly by the Contractor, or by others when so noted.

1.04 INDUSTRY STANDARDS

A. Applicability of Standards: Except where 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. Such standards are made a part of the Contract Documents by reference.

B. Conflicting Requirements: Where compliance with two or more standards is specified, and they establish different or conflicting requirements for minimum quantities or quality levels, the most stringent requirement will be enforced, unless the Contract Documents indicate otherwise. Refer requirements that are different, but apparently equal, and uncertainties as to which quality level is more stringent to the Government for a decision before proceeding

C. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. Where such acronyms or abbreviations are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards generating organization, authority having jurisdiction, or other entity applicable to the context of the text provision. Refer to the "Encyclopedia of Associations," published by Gale Research Co., available in most libraries.

END OF SECTION

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SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary telecommunications services.

B. Temporary sanitary facilities.

C. Temporary Controls: Barriers, enclosures, and fencing.

D. Security requirements.

E. Vehicular access and parking.

F. Waste removal facilities and services.

G. Project identification sign.

H. Field offices.

1.02 RELATED REQUIREMENTS

A. Section 015100 - Temporary Utilities.

B. Section 015213 - Field Offices and Sheds.

C. Section 015500 - Vehicular Access and Parking.

1.03 TELECOMMUNICATIONS SERVICES

A. Provide, maintain, and pay for telecommunications services to field office(s) at time of project mobilization.

B. Telecommunications services shall include:

1. Windows-based personal computer dedicated to project telecommunications, with necessary software and laser printer.

2. Internet Connections: Minimum of one; DSL modem or faster.

1.04 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.

B. Maintain daily in clean and sanitary condition.

1.05 FENCING

A. Provide minimum of 6 foot (1.8 m) high fence around construction site; equip with vehicular and pedestrian gates with locks.Contractor is responsible for site safety. Fencing requirement listed above is a minimum only. Contractor to provide all fencing/site protection measures to ensure the safety of the site and public.

1.06 VEHICULAR ACCESS AND PARKING - See Section 015500

A. Coordinate access and haul routes with governing authorities and Contracting Officer Representative(s).

B. Provide and maintain access to fire hydrants, free of obstructions.

C. Provide means of removing mud from vehicle wheels before entering streets.

D. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

1.07 WASTE REMOVAL

A. See Section 017419 - Construction Waste Management and Disposal, for additional requirements.

B. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.

C. Provide containers with lids. Remove trash from site daily.

D. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.

E. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.08 PROJECT IDENTIFICATION

A. Provide project identification sign of design, construction, and location approved by the Government. Sign shall minimum 4'-0" by 8'-0" constructed of 3/4" XT grade plywood with 3/4" x 1-5/8" pressure treated wood border. Mount sign on pressure treated 4" x 4" posts. Paint sign background white with sign text in contrasting colors.

B. Sign to contain the following minimum information:

1. Project Name(s)

2. General Contractor's Company Information
3. Architect's Company Information
4. Government's Point of Contact (as directed by the Contracting Officer)
5. Contractor's primary points of contact including emergency contact for each project
6. Include architectural renderings of the project(s). Architect's office will furnish a digital file of the design for the Contractor's use in fabricating the project sign.
7. All required legal postings.

C. No other signs are allowed without Government permission except those required by law.

1.09 FIELD OFFICES - See Section 015213

1.10 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, materials, prior to Beneficial Occupancy inspection.

B. Remove underground installations to a minimum depth of 2 feet (600 mm). Grade site as indicated.

C. Clean and repair damage caused by installation or use of temporary work.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

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SECTION 015100 - TEMPORARY UTILITIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary Utilities: Provision of electricity, lighting, heat, ventilation, and water.

1.02 RELATED REQUIREMENTS

A. Section 015000 - Temporary Facilities and Controls:

1. Temporary telecommunications services for administrative purposes.

2. Temporary sanitary facilities required by law.

1.03 REFERENCE STANDARDS

A. 29 CFR 1926 - Safety and Health Regulations for Construction Current Edition.

1.04 TEMPORARY ELECTRICITY

A. Connect to the Government's existing power service.

1. Do not disrupt the Government's existing power service.

2. Exercise measures to conserve energy.

B. Complement existing power service capacity and characteristics as required.

C. Provide power outlets for construction operations, with branch wiring and distribution boxes located at each floor. Provide flexible power cords as required.

D. Provide main service disconnect and over-current protection at convenient location and meter.

E. Permanent convenience receptacles may be utilized during construction.

F. Provide adequate distribution equipment, wiring, and outlets to provide single phase branch circuits for power and lighting.

1.05 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

A. Provide and maintain the type lighting suitable for the application for construction operations in accordance with requirements of 29 CFR 1926 and authorities having jurisdiction.

B. Provide and maintain 1 watt/sq ft (10.8 watt/sq m) lighting to exterior staging and storage areas after dark for security purposes.

C. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.

D. Maintain lighting and provide routine repairs.

E. Permanent building lighting may be utilized during construction.

1.06 TEMPORARY HEATING

A. Cost of Energy: By the Government.

B. Provide heating devices and heat as needed to maintain specified conditions for construction operations.

C. Exercise measures to conserve energy.

D. Prior to operation of permanent equipment for temporary heating purposes, verify that installation is approved for operation, equipment is lubricated and filters are in place. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts. Use of permanent equipment for temporary heating purposes shall not affect the specified warranty periods for equipment. All equipment shall be warranted for specified warranty period starting with the date of Beneficial Occupancy.

1.07 TEMPORARY COOLING

A. Cost of Energy: By the Government.

B. Provide cooling devices and cooling as needed to maintain specified conditions for construction operations.

C. Exercise measures to conserve energy.

D. Prior to operation of permanent equipment for temporary cooling purposes, verify that installation is approved for operation, equipment is lubricated and filters are in place. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts. Use of permanent equipment for temporary cooling purposes shall not affect the specified warranty periods for equipment. All equipment shall be warranted for specified warranty period starting with the date of Beneficial Occupancy.

1.08 TEMPORARY VENTILATION

A. Neither existing to remain or permanent ventilation equipment may not be used.

B. Provide temporary ventilation as required to maintain specified conditions for construction operations and as required by applicable laws and regulations to maintain a safe and healthy work environment.

1.09 TEMPORARY WATER SERVICE

A. Cost of Water Used: By the Government.

B. Provide and maintain suitable quality water service for construction operations at time of project mobilization.

C. Connect to existing water source.

D. Exercise measures to conserve water.

E. Extend branch piping with outlets located so water is available by hoses with threaded connections. Provide temporary pipe insulation to prevent freezing.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

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SECTION 015213 - FIELD OFFICES AND SHEDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary field offices for use of Contractor.

B. Maintenance and removal.

1.02 RELATED REQUIREMENTS

A. Section 01 0102 - Project Information and Summary

B. Section 015000 - Temporary Facilities and Controls:

1. Temporary telecommunications services for administrative purposes.

2. Temporary sanitary facilities required by law.

C. Section 015000: Parking and access to field offices.

1.03 USE OF EXISTING FACILITIES

A. Existing facilities shall not be used for field offices.

PART 2 PRODUCTS

2.01 MATERIALS, EQUIPMENT, FURNISHINGS

A. Materials, Equipment, Furnishings: Serviceable, new or used, adequate for required purpose.

2.02 CONSTRUCTION

A. Portable or mobile buildings, or buildings constructed with floors raised above ground, securely fixed to foundations, with steps and landings at entrance doors.

B. Construction: Structurally sound, secure, weather tight enclosures for office. Maintain during progress of Work; remove at completion of Work.

C. Exterior Materials: Weather resistant, finished in one color.

D. Interior Materials in Offices: Sheet type materials for walls and ceilings, prefinished or painted; resilient floors and bases.

E. Lighting for Offices: 50 fc (538 lx) at desk top height, exterior lighting at entrance doors.

F. Fire Extinguishers: Appropriate type fire extinguisher at each office.

2.03 ENVIRONMENTAL CONTROL

A. Heating, Cooling, and Ventilating: Automatic equipment to maintain comfort conditions.

2.04 CONTRACTOR OFFICE AND FACILITIES

A. Size: For Contractor's needs and to provide space for project meetings.

B. Telephone: As specified in Section 015000.

C. Furnishings in Meeting Area: Conference table and chairs to seat at least eight persons; racks and files for Contract Documents, submittals, and project record documents.

D. Other Furnishings: Contractor's option.

E. Equipment: Six adjustable band protective helmets for visitors, one 10 inch (250 mm) outdoor weather thermometer .

F. Architect, Contracting Officer Representative, and Contracting Officer shall have full use of office for the duration of the project.

PART 3 EXECUTION

3.01 PREPARATION

A. Fill and grade sites for temporary structures to provide drainage away from buildings.

3.02 INSTALLATION

A. Install office spaces ready for occupancy 15 days after date fixed in Notice to Proceed.

B. Parking: Four hard surfaced parking spaces for use by the Government, connected to office by hard surfaced walk.

3.03 MAINTENANCE AND CLEANING

A. Weekly janitorial services for offices; periodic cleaning and maintenance for offices.

B. Maintain approach walks free of mud, water, and snow.

3.04 REMOVAL

A. At completion of Work remove buildings, foundations, utility services, and debris. Restore areas.

END OF SECTION

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SECTION 015460 - SAFETY AND HEALTH

PART 1 GENERAL

1.01 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

B. Code of Federal Regulations (CFR):

1. OSHA General Industry Safety and Health Standards (29 CFR 1910), Publication V2206; OSHA Construction Industry Standards (29 CFR 1926). One source of these regulations is OSHA Publication 2207, which includes a combination of both Parts 1910 and 1926 as they relate to construction safety and health. It is for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

2. National Emission Standards for Hazardous Air Pollutants (40 CFR, Part 61).

3. Environmental Protection Agency (EPA) Final Rule (40 CFR Part 761) dated July 17, 1985.

C. Federal Standard (Fed. Std):

1. 313A Material Safety Data Sheets, Preparation and the Submission of.

1.02 WORK COVERED BY THIS SECTION

A. This section is applicable to all work covered by this contract.

1.03 DEFINITION OF HAZARDOUS MATERIALS

A. Refer to hazardous and toxic materials/substances included in Subparts H and Z of 29 CFR 1910; and to others as additionally defined in Fed. Std. 313. Those most commonly encountered include asbestos, polychlorinated biphenyls (PCB'S), explosives, and radioactive material, but may include others. The most likely products to contain asbestos are sprayed-on fireproofing, insulation, boiler lagging, pipe covering and likely products to contain PCB's are transformers, capacitors, voltage regulators, and oil switches.

1.04 QUALITY ASSURANCE

A. Safety Meeting: Representatives of the Contractor shall meet with the Contracting Officer and his/her representative(s) prior to the start of work under this contract for the

purpose of reviewing the Contractor's safety and health programs and discussing implementation of all safety and health provisions pertinent to the work to be performed under the contract. The Contractor shall be prepared to discuss, in detail, the measures he/she intends to take in order to control any unsafe or unhealthy conditions associated with the work to be performed under the contract. If directed by the Contracting Officer, this meeting may be held in conjunction with other meetings which are scheduled to take place prior to start of work under this contract. The level of detail for the safety meeting is dependent upon the nature of the work and the potential inherent hazards. The Contractor's principal on-site representative(s), the general superintendent and his/her safety representative(s) shall attend this meeting.

B. Compliance With Regulations: All work, including contact with and handling of hazardous materials, the disturbance or dismantling of structures containing hazardous materials and/or the disposal of hazardous materials shall comply with the applicable requirements of 29 CFR 1926/1910 and 40 CFR 761. Work involving the disturbance, dismantling of asbestos or asbestos containing materials; the demolition of structures containing asbestos; and/or the disposal and removal of asbestos, shall also comply with the requirements of 40 CFR, Part 61, Subparts A and M. AlI work shall comply with applicable state and municipal safety and health requirements. Where there is a conflict between applicable regulations, the most stringent shall apply.

C. Contractor Responsibility: The Contractor shall assume full responsibility and liability for compliance with all applicable regulations pertaining to the health and safety of personnel during the execution of work, and shall hold the Government harmless for any action on his/her part or that of his/her employees or subcontractors, which results in illness, injury or death.

D. The contractor shall provide and submit a site specific Safety Plan and Quality Control Plan for review and approval by the Government.

1.05 SUBMITTALS

A. Accident Reporting: A copy of each accident report, which the Contractor or subcontractors submit to their insurance carriers, shall be forwarded through the Construction Engineer to the Contracting Officer as soon as possible, but in no event later than seven (7) calendar days after the day the accident occurred.

B. Permits: If hazardous materials are disposed of off site, submit copies of permits from applicable, Federal, state, or municipal authorities and necessary certificates that the material has been disposed of as per regulations.

C. Other Submittals: If agreed to in writing at the safety meeting, other submittals shall be required. One such submittal which may be included is a plan of action for handling

hazardous materials, which shall contain the following:

1. Number, type, and experience of employees to be used for the work.
2. Description of how applicable safety and health regulations and standards are to be met.
3. Type of protective equipment and work procedures to be used.
4. Emergency procedures for accidental spills or exposures.
5. Procedures for disposing of or storing the toxic/hazardous materials.
6. Identification of possible hazards, problems, and proposed control mechanisms.
7. Protection of public or others not related to the operation.
8. Interfacing and control of subcontractors, if any.
9. Identifications of any required analyses, test demonstrations, and validation requirements.
10. Method of certification for compliance.

PART 2 PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. Special facilities, devices, equipment, clothing, and similar items used by the Contractor in the execution of work shall comply with the applicable regulations.

2.02 HAZARDOUS MATERIALS

A. The Contractor shall bring to the attention of the Contracting Officer any material suspected of being hazardous, that are not indicated on the abatement drawings, which he/she encounters during execution of the work. A determination will be made by the Contracting Officer as to whether the Contractor shall Perform tests to determine if the material is hazardous. lf the Contracting Officer directs the Contractor to perform tests, and/or if the material is found hazardous and additional protective measures are needed, a contract change may be required, subject to applicable provisions of this contract.

PART 3 EXECUTION

3.01 STOP WORK ORDERS

A. When the Contractor or his/her subcontractors are notified by the Contracting Officer's representative(s) of any noncompliance with the provisions of the contract and the action(s) to be taken, the Contractor shall immediately, if so directed, or within 48 hours after receipt of a notice of violation correct the unsafe or unhealthy condition. If the Contractor fails to comply promptly, all or any part of the work being performed may be stopped by the Contracting Officer or his/her representative(s) with a "Stop Work Order." When, in the opinion of the Contracting Officer or his/her representative(s), satisfactory corrective action has been taken to correct the unsafe and unhealthy condition, a start order will be given immediately. The Contractor shall not be allowed any extension of time or compensation for damages by reason of or in connection with such work stoppage.

3.02 PROTECTION

A. The Contractor shall take all necessary precautions to prevent injury to the public, building occupants, or damage to property of others. For the purposes of this contract, the public or building occupants shall include all persons not employed by the Contractor or a subcontractor working under his/her direction.

B. Storing, positioning or use of equipment, tools, materials, scraps, and trash in a manner likely to present a hazard to the public or building occupants by its accidental shifting, ignition, or other hazardous qualities is prohibited.

C. Obstructions: No corridor, aisle, stairway, door, or exit shall be obstructed or used in such a manner as to encroach upon routes of ingress or egress utilized by the public or building occupant, or to present unsafe or unhealthy condition to the public or building occupant.

D. Work shall not be performed in any area occupied by the public or Federal employees unless specifically permitted by the contract or the Contracting Officer and unless adequate steps are taken for the protection of the public or Federal employees.

E. Wherever practicable, the work area shall be fenced, barricaded, or otherwise blocked off from the public or building occupants to prevent unauthorized entry into the work area.

F. Alternate Precautions: When the nature of the work prevents isolation of the work area and the public or building occupants may be in or pass through, under or over the work area, alternate precautions such as the posting of signs, the use of signal persons, the

erection of barricades or similar protection around particularly hazardous operations shall be used as appropriate.

G. Public Thoroughfare: When work is to be performed over a public thoroughfare such as a sidewalk, lobby, or corridor, the thoroughfare shall be closed, if possible, or other precautions taken such as the installation of screens or barricades. When the exposure to heavy falling objects exists, as during the erection of building walls or during demolition, special protection of the type detailed in 29 CFR 1910/1926 shall be provided.

H. Fences and barricades shall be removed upon completion of the project, in accordance with local ordinance and to the satisfaction of the Contracting Officer or his/her representative(s).

END OF SECTION

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SECTION 015500 - VEHICULAR ACCESS AND PARKING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Access roads.

B. Parking.

C. Existing pavements and parking areas.

D. Construction parking controls.

E. Flag persons.

F. Haul routes.

G. Traffic signs and signals.

H. Maintenance.

I. Mud from site vehicles.

1.02 RELATED REQUIREMENTS

A. Section 01 0102 Project Information and Summary

PART 2 PRODUCTS

2.01 MATERIALS

A. Temporary Construction: Contractor's option.

B. Materials for Permanent Construction: As specified in product specification sections, including earthwork, paving base, and topping.

2.02 SIGNS, SIGNALS, AND DEVICES

A. Post Mounted and Wall Mounted Traffic Control and Informational Signs: Specified in Section 015813 - Temporary Project Signage.

B. Traffic Cones and Drums, Flares and Lights: As approved by local jurisdictions.

C. Flag Person Equipment: As required by local jurisdictions.

PART 3 EXECUTION

3.01 ACCESS ROADS

A. Use of existing on-site streets and driveways for construction traffic is permitted.

B. Tracked vehicles not allowed on paved areas.

C. Provide unimpeded access for emergency vehicles. Maintain 20 foot (6 m) width driveways with turning space between and around combustible materials.

D. Provide and maintain access to fire hydrants free of obstructions.

3.02 PARKING

A. Use of designated areas of existing parking facilities by construction personnel is permitted.

B. When site space is not adequate, provide additional off-site parking.

3.03 CONSTRUCTION PARKING CONTROL

A. Control vehicular parking to prevent interference with public traffic and parking, access by emergency vehicles, and the Government's operations.

B. Prevent parking on or adjacent to access roads or in non-designated areas.

3.04 FLAG PERSONS

A. Provide trained and equipped flag persons to regulate traffic when construction operations or traffic encroach on public traffic lanes.

3.05 HAUL ROUTES

A. Confine construction traffic to designated haul routes as approved by the Government.

B. Provide traffic control at critical areas of haul routes to regulate traffic, to minimize interference with public traffic.

C. Keep all haul roads clean and free of foreign objects debris. Refer to Part 3.08 below.

3.06 TRAFFIC SIGNS AND SIGNALS

A. At approaches to site and on site, install at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic.

B. Relocate as work progresses, to maintain effective traffic control.

3.07 MAINTENANCE

A. Maintain traffic and parking areas in a sound condition free of excavated material, construction equipment, products, mud, snow, and ice.

B. Maintain existing paved areas used for construction; promptly repair breaks, potholes, low areas, standing water, and other deficiencies, to maintain paving and drainage in original, or specified, condition.

3.08 MUD FROM SITE VEHICLES

A. All vehicles accessing the site shall be free of mud and other debris prior to entering the site to prevent foreign object debris (FOD) from inhibiting operations of the base.

B. Routinely clean site paving and haul roads to remove all loose dirt and possible FOD. Coordinate with Government representatives to maintain acceptable levels.

C. The Government reserves the right to request vehicles be clean and/or removed from the premises due to FOD debris concerns.

END OF SECTION

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SECTION 015719 - TEMPORARY ENVIRONMENTAL CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Construction procedures to promote adequate Indoor Air Quality (IAQ) during and after construction.

1. Control of emissions during construction.

2. Moisture control during construction.

B. Procedures for testing baseline IAQ. Baseline IAQ requirements specify maximum indoor pollutant concentrations for acceptance of the facility.

C. Testing indoor air quality after completion of construction.

D. Testing air change effectiveness after completion of construction.

1.02 PROJECT GOALS

A. See Section 013225 - Project Sustainability Summary, for overall project goals relating to environment and energy.

B. Dust and Airborne Particulates: Prevent deposition of dust and other particulates in HVAC ducts and equipment.

1. Cleaning of ductwork is not contemplated under this Contract.

2. Contractor shall bear the cost of cleaning required due to failure to protect ducts and equipment from construction dust.

C. Airborne Contaminants: Procedures and products have been specified to minimize indoor air pollutants.

1. Furnish products meeting the specifications.

2. Avoid construction practices that could result in contamination of installed products leading to indoor air pollution.

1.03 RELATED REQUIREMENTS

A. Section 01 3225 - Project Sustainability Summary.

B. Section 01 3329 - Sustainable Design Reporting.

C. Section 014000 - Quality Requirements: Testing and inspection services.

D. Section 016116 - Volatile Organic Compound (VOC) Content Restrictions.

E. Section 01 9100.015 - Total Building Commissioning

F. Division 23 Sections for HVAC Air Cleaning Devices: HVAC filters.

G. Division 23 Sections for HVAC Testing, Adjusting, and Balancing

1.04 REFERENCE STANDARDS

A. ASHRAE Std 52.2 - Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size 2017, with Addendum (2022).

B. ASHRAE Std 129 - Measuring Air-Change Effectiveness 1997 (Reaffirmed 2002).

C. ASTM D5197 - Standard Test Method for Determination of Formaldehyde and Other Carbonyl Compounds in Air (Active Sampler Methodology) 2021.

D. CAL (CDPH SM) - Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers Version 1.2 2017.

E. EPA 600/4-90/010 - Compendium of Methods for the Determination of Air Pollutants in Indoor Air 1990.

F. EPA 625/R-96/010b - Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air 1999.

G. SMACNA (OCC) - IAQ Guidelines for Occupied Buildings Under Construction 2007.

1.05 DEFINITIONS

A. Definitions pertaining to sustainable development: As defined in ASTM E2114.

B. Adequate ventilation: Ventilation, including air circulation and air changes, required to cure materials, dissipate humidity, and prevent accumulation of particulates, dust, fumes, vapors, or gases.

C. Adsorptive Materials: Gypsum board, acoustical ceiling tile and panels, carpet and carpet tile, fabrics, fibrous insulation, and other similar products.

D. Contaminants: Gases, vapors, regulated pollutants, airborne mold and mildew, and the like, as specified.

E. Particulates: Dust, dirt, and other airborne solid matter.

F. Wet Work: Concrete, plaster, coatings, and other products that emit water vapor or volatile organic compounds during installation, drying, or curing.

1.06 SUBMITTALS

A. See Section 01 3001 - Submittals for submittal procedures.

B. Indoor Air Quality Management Plan: Describe in detail measures to be taken to promote adequate indoor air quality upon completion; use SMACNA (OCC) as a guide.

1. Submit not less than 60 days before enclosure of building.
2. Identify potential sources of odor and dust.
3. Identify construction activities likely to produce odor or dust.
4. Identify areas of project potentially affected, especially occupied areas.
5. Evaluate potential problems by severity and describe methods of control.
6. Describe construction ventilation to be provided, including type and duration of ventilation, use of permanent HVAC systems, types of filters and schedule for replacement of filters.
7. Describe cleaning and dust control procedures.
8. Describe coordination with commissioning procedures.
9. Include post-construction IAQ management measures.

C. Interior Finishes Installation Schedule: Identify each interior finish that either generates odors, moisture, or vapors or is susceptible to adsorption of odors and vapors, and indicate air handling zone, sequence of application, and curing times.

D. Duct and Terminal Unit Inspection Report.

E. Air Contaminant Test Plan: Identify:

1. Testing agency qualifications.
2. Locations and scheduling of air sampling.
3. Test procedures, in detail.
4. Test instruments and apparatus.

5. Sampling methods.

F. Air Contaminant Test Reports: Show:

1. Location where each sample was taken, and time.
2. Test values for each air sample; average the values of each set of 3.
3. HVAC operating conditions.
4. Certification of test equipment calibration.
5. Other conditions or discrepancies that might have influenced results.

G. Ventilation Effectiveness Test Plan: Identify:

1. Testing agency qualifications.
2. Description of test spaces, including locations of air sampling.
3. Test procedures, in detail; state whether tracer gas decay or step-up will be used.
4. Test instruments and apparatus; identify tracer gas to be used.
5. Sampling methods.

H. Ventilation Effectiveness Test Reports: Show:

1. Include preliminary tests of instruments and apparatus and of test spaces.
2. Calculation of ventilation effectiveness, E.
3. Location where each sample was taken, and time.
4. Test values for each air sample.
5. HVAC operating conditions.
6. Other information specified in ASHRAE Std 129.
7. Other conditions or discrepancies that might have influenced results.

I. IAQ Management Report: Detailed photo log of the construction IAQ management plan practices followed during construction

1. Submit log with each Application for Progress Payment; failure to submit Report will delay payment.

2. Submit Report on a form acceptable to Government.

PART 2 PRODUCTS

2.01 MATERIALS

A. Low VOC Materials: See other sections for specific requirements for materials with low VOC content.

B. Auxiliary Air Filters: MERV of 8, minimum, when tested in accordance with ASHRAE Std 52.2.

PART 3 EXECUTION

3.01 CONSTRUCTION PROCEDURES

A. Prevent the absorption of moisture and humidity by adsorptive materials by:

1. Sequencing the delivery of such materials so that they are not present in the building until wet work is completed and dry.

2. Delivery and storage of such materials in fully sealed moisture-impermeable packaging.

3. Provide sufficient ventilation for drying within reasonable time frame.

B. Begin construction ventilation when building is substantially enclosed.

C. If extremely dusty or dirty work must be conducted inside the building, shut down HVAC systems for the duration; remove dust and dirt completely before restarting systems.

D. Use of HVAC equipment and ductwork for ventilation during construction is not permitted:

1. Exhaust directly to outside.

2. Seal HVAC air inlets and outlets immediately after duct installation.

E. Do not store construction materials or waste in mechanical or electrical rooms.

F. Prior to use of return air ductwork without intake filters clean up and remove dust and debris generated by construction activities.

1. Inspect duct intakes, return air grilles, and terminal units for dust.

2. Clean plenum spaces, including top sides of lay-in ceilings, outsides of ducts, tops of pipes and conduit.

3. Clean tops of doors and frames.

4. Clean mechanical and electrical rooms, including tops of pipes, ducts, and conduit, equipment, and supports.

5. Clean return plenums of air handling units.

6. Remove intake filters last, after cleaning is complete.

G. Do not perform dusty or dirty work after starting use of return air ducts without intake filters.

H. Use other relevant recommendations of SMACNA (OCC) for avoiding unnecessary contamination due to construction procedures.

I. Pathway Interruption: Isolate areas of work as necessary to prevent contamination of clean or occupied spaces. Provide pressure differentials and/or physical barriers to protect clean or occupied spaces.

3.02 BUILDING FLUSH-OUT

A. Contractor's Option: Either full continuous flush-out OR satisfactory air contaminant testing is required.

B. Testing Option: Engage testing agency to perform satisfactory air contaminant testing. If the testing fails due high concentrations or other factors, the Contractor shall assist testing agency in supplemental flush-out. If the concentration levels remain to high, the contractor shall comply with the flush-out procedures.

C. Perform building flush-out before occupancy.

D. Do not start flush-out until:

1. All construction is complete.

2. HVAC systems have been tested, adjusted, and balanced for proper operation.

3. Inspection of inside of return air ducts and terminal units confirms that cleaning is not necessary.

4. New HVAC filtration media have been installed.

E. Building Flush-Out: Operate all ventilation systems at normal flow rates with 100 percent outside air until a total air volume of 14,000 cubic feet per square foot (4500 cubic meters per square meter) of floor area has been supplied.

1. Obtain the Government's concurrence that construction is complete enough before beginning flush-out.

2. Maintain interior temperature of at least 60 degrees F (15 degrees C) and interior relative humidity no higher than 60 percent.

3. If additional construction involving materials that produce particulates or any of the specified contaminants is conducted during flush-out, start flush-out over.

4. If interior spaces must be occupied prior to completion of the flush-out, supply a minimum of 25 percent of the total air volume prior to occupancy, and:

a. Begin ventilation at least three hours prior to daily occupancy.

b. Continue ventilation during all occupied periods.

c. Provide minimum outside air volume of 0.30 cfm per square foot (0.0015 cu m/s/sq m) or design minimum outside air rate, whichever is greater.

F. Install new HVAC filtration media after completion of flush-out and before occupancy or further testing.

3.03 AIR CONTAMINANT TESTING

A. Contractor's Option: Either full continuous flush-out, or satisfactory air contaminant testing is required, not both.

B. Perform air contaminant testing before occupancy.

C. Prior to testing, operate the ventilation system within 10% of the design outdoor airflow rate for at least 24 hours.

D. Conduct baseline indoor-air-quality testing, after construction ends and prior to occupancy, using testing protocols consistent with the EPA's Compendium of Methods for the Determination of Toxic Organic Pollutants in Ambient Air, TO-1, TO-11, TO-17, and ASTM Standard Method D5197

E. Do not start air contaminant testing until:

1. All construction is complete, including interior finishes.

2. HVAC systems have been tested, adjusted, and balanced for proper operation.

3. New HVAC filtration media have been installed.

F. Indoor Air Samples: Collect from spaces representative of occupied areas:

1. Collect samples while operable windows and exterior doors are closed, HVAC system is running normally as if occupied, with design minimum outdoor air, but with the building unoccupied.

2. Collect samples from spaces in each contiguous floor area in each air handler zone, but not less than one sample per 25,000 square feet (2300 square meters); take samples from areas having the least ventilation and those having the greatest presumed source strength.

3. Collect samples from height from 36 inches (915 mm) to 72 inches (1830 mm) above floor.

4. Collect samples from same locations on 3 consecutive days during normal business hours; average the results of each set of 3 samples.

5. Exception: Areas with normal very high outside air ventilation rates, such as laboratories, do not need to be tested.

6. When retesting the same building areas, take samples from at least the same locations as in first test.

G. Outdoor Air Samples: Collect samples at outside air intake of each air handler at the same time as indoor samples are taken.

H. Analyze air samples and submit report.

I. Air Contaminant Concentration Limits:

1. Evaluate pollutant concentrations against the maximum allowable concentrations listed in ASHRAE 189.1 Table 10.3.1.4

2. Formaldehyde: Not more than 27 parts per billion.

3. PM10 Particulates: Not more than 50 micrograms per cubic meter.

4. Total Volatile Organic Compounds (TVOCs): Not more than 500 micrograms per cubic meter.

5. Chemicals Listed in CAL (CDPH SM) Table 4-1, except Formaldehyde: Allowable concentrations listed in Table 4-1.

6. Carbon Monoxide: Not more than 9 parts per million and not more than 2 parts per million higher than outdoor air.

J. Air Contaminant Concentration Test Methods:

1. Formaldehyde: ASTM D5197, EPA 625/R-96/010b Method TO-11A, or EPA 600/4-90/010 Method IP-6.

2. Particulates: EPA 600/4-90/010 Method IP-10.

3. Total Volatile Organic Compounds (TVOC): EPA 625/R-96/010b Method TO-1, TO-15, or TO-17; or EPA 600/4-90/010 Method IP-1.

4. Chemicals Listed in CAL (CDPH SM) Table 4-1, except Formaldehyde: ASTM D5197, or EPA 625/R-96/010b Method TO-1, TO-15, or TO-17.

5. Carbon Monoxide: EPA 600/4-90/010 Method IP-3, plus measure outdoor air; measure in ppm; report both indoor and outdoor measurements.

3.04 VENTILATION EFFECTIVENESS TESTING

A. Perform ventilation effectiveness testing before occupancy.

B. Do not begin ventilation effectiveness testing until:

1. HVAC testing, adjusting, and balancing has been satisfactorily completed.

2. Building flush-out or air contaminant testing has been completed satisfactorily.

3. New HVAC filtration media have been installed.

C. Test each air handler zone in accordance with ASHRAE Std 129.

D. If calculated air change effectiveness for a particular zone is less than 0.9 due to inadequate balancing of the system, adjust, and retest at no cost to the Government.

END OF SECTION

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SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General product requirements.

B. Re-use of existing products.

C. Transportation, handling, storage and protection.

D. Product option requirements.

E. Limited Source Product Requirements

F. Substitution limitations.

G. Procedures for Government-supplied products.

H. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 RELATED REQUIREMENTS

A. Section 00 0102 - Project Information and Summary.

B. Section 014000 - Quality Requirements: Product quality monitoring.

C. Section 016116 - Volatile Organic Compound (VOC) Content Restrictions: Requirements for VOC-restricted product categories.

D. Section 017419 - Construction Waste Management and Disposal: Waste disposal requirements potentially affecting product selection, packaging and substitutions.

1.03 SUBMITTALS

A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.

1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

1.04 SUBMITTAL SCHEDULE

A. At the beginning of the project, generate a comprehensive list of products requiring submittals by the specifications.

1. Refer also to section 01 3001 - Submittals.

B. Coordinate product submittal schedule with project construction schedule.

C. Submit schedule to the Government for review within 15 days of Notice to Proceed.

D. If necessary, revise schedule as requested by the Government

E. Schedule will be utilized at each progress meeting to review status of required submittals and coordination with project construction schedule.

1. Update submittal schedule and submit to the Government 48 hours prior to each scheduled progress meeting.

1.05 QUALITY ASSURANCE

A. Source Limitations: To the fullest extent possible, provide products of the same kind, from a single source.

B. Each prime Contractor is responsible for providing products and construction methods that are compatible with products and construction methods of other prime or separate Contractors.

C. If a dispute arises between prime Contractors over concurrently selectable, but incompatible products, the Government will determine which products shall be retained and which are incompatible and must be replaced.

D. Nameplates: Except for required labels and operating data, do not attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products which will be exposed to view in occupied spaces or on the exterior.

E. Labels: Locate required product labels and stamps on a concealed surface or, where required for observation after installation, on an accessible surface that is not conspicuous.

PART 2 PRODUCTS

2.01 EXISTING PRODUCTS

A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by the Contract Documents.

B. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Government, or otherwise indicated as to remain the property of the Government, become the property of the Contractor; remove from site.

2.02 NEW PRODUCTS

A. Provide new products unless specifically required or permitted by the Contract Documents.

B. DO NOT USE products having any of the following characteristics:

1. Made using or containing CFC's or HCFC's.

2. Made of wood from newly cut old growth timber.

C. Where all other criteria are met, Contractor shall give preference to products that:

1. If used on interior, have lower emissions, as defined in Section 016116.

2. If wet-applied, have lower VOC content, as defined in Section 016116.

3. Are extracted, harvested, and/or manufactured closer to the location of the project.

4. Have longer documented life span under normal use.

5. Result in less construction waste. See Section 017419

6. Are made of recycled materials.

7. If made of wood, are made of sustainably harvested wood, wood chips, or wood fiber.

8. If bio-based, other than wood, are or are made of Sustainable Agriculture Network certified products.

9. Have a published GreenScreen Chemical Hazard Analysis.

2.03 PRODUCT SELECTION

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, unused at the time of installation.

B. Provide products complete with all accessories, trim, finish, safety guards and other devices and details needed for a complete installation and for the intended use and effect.

C. Standard Products: Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.

D. Product Selection Procedures: Product selection is governed by the Contract Documents and governing regulations, not by previous Project experience. Procedures governing product selection include the following:

E. Where products or manufacturers are specified by name, accompanied by the term "or equal," or "or approved equal" comply with the Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product, unless noted otherwise in specific specification section.

F. Non-Proprietary Specifications: When the Specifications list products or manufacturers that are available and may be incorporated in the Work, but do not restrict the Contractor to use of these products only, the Contractor may propose any available product that complies with Contract requirements. Comply with Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.

G. Descriptive Specification Requirements: Where Specifications describe a product or assembly, listing exact characteristics required, with or without use of a brand or trade name, provide a product or assembly that provides the characteristics and otherwise complies with Contract requirements.

H. Compliance with Standards, Codes and Regulations: Where the Specifications only require compliance with an imposed code, standard or regulation, select a product that complies with the standards, codes or regulations specified.

I. Visual Matching: Where Specifications require matching an established Sample, the Government's decision will be final on whether a proposed product matches satisfactorily.

J. Where no product available within the specified category matches satisfactorily and also complies with other specified requirements, comply with provisions of the

Contract Documents concerning "substitutions" for selection of a matching product in another product category, or for noncompliance with specified requirements.

K. Visual Selection: Where specified product requirements include the phrase "...as selected from manufacturer's standard colors, patterns, textures..." or a similar phrase, select a product and manufacturer that complies with other specified requirements. The Government will select the color, pattern and texture from the product line selected.

2.04 PRODUCT OPTIONS

A. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

B. Compatibility of Options: When the Contractor is given the option of selecting between two or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.

2.05 LIMITED SOURCE PRODUCT REQUIREMENTS

A. The following products/manufacturers are require to be provided, by name, with substitutions not allowed:

1. Johnson Controls, Inc., for building automation and energy management systems and equipment.

2. Monaco Enterprises, Inc., for fire alarm transceiver antennae for communication with existing base fire alarm reporting systems.

3. BEST Access System Lockset for door cores/locks. Contractor shall ensure all cylinders and other door hardware components are compatible with specified BEST systems and capable of receiving BEST cores.

B. Refer to the Government's limited source justification(s) included with the project solicitation for additional information.

2.06 MAINTENANCE MATERIALS

A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.

B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION LIMITATIONS

A. The Government will consider requests for substitutions only within 30 days after date established in Notice to Proceed.

   1. Substitutions received after this time period may be considered or rejected at the discretion of the Government.

B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.

C. A request for substitution constitutes a representation that the submitter:

   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.

   2. Will provide the same warranty for the substitution as for the specified product.

   3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to the Government.

   4. Waives claims for additional costs or time extension that may subsequently become apparent.

   5. Will reimburse the Government for review or redesign services associated with re-approval by authorities.

D. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

E. Substitution Submittal Procedure:

   1. Submit three copies of request for substitution for consideration. Limit each request to one proposed substitution.

   2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.

   3. The Government will notify Contractor in writing of decision to accept or reject request.

F. Conditions: The Contractor's substitution request will be received and considered by the Government only when one or more of the following conditions are satisfied, as

determined by the Government; otherwise requests will be returned without action except to record noncompliance with these requirements.

1. Extensive revisions to Contract Documents are not required.
2. Proposed changes are in keeping with the general intent of Contract Documents.
3. The request is timely, fully documented and properly submitted.
4. The request is directly related to an "or equal" clause or similar language in the Contract Documents.
5. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
6. A substantial advantage is offered the Government, in terms of cost, time, energy conservation or other considerations of merit
7. The specified product or method of construction cannot be provided in a manner that is compatible with other materials, and where the Contractor certifies that the substitution will overcome the incompatibility.
8. The specified product or method of construction cannot be coordinated with other materials, and where the Contractor certifies that the proposed substitution can be coordinated.
9. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution provide the required warranty.

G. The Government reserves the right to reject any substitutions.

3.02 GOVERNMENT-SUPPLIED PRODUCTS

A. The Government's Responsibilities

1. Arrange for and deliver Government reviewed shop drawings, product data and samples, to Contractor.
2. Arrange and pay for product delivery to site unless specifically noted otherwise.
3. On delivery, inspect products jointly with Contractor.
4. Submit claims for transportation damage and replace damaged, defective, or deficient items.

5. Arrange for manufacturers' warranties, inspections and service.

B. Contractor's Responsibilities:

1. Review Government reviewed shop drawings, product data, and samples.

2. Receive and unload products at site; inspect for completeness or damage jointly with the Government

3. Handle, store, install and finish products.

4. Repair or replace items damaged after receipt.

3.03 TRANSPORTATION AND HANDLING

A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.

B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.

C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

D. Transport and handle products in accordance with manufacturer's instructions.

E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.

F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.

H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.04 STORAGE AND PROTECTION

A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.

B. Store and protect products in accordance with manufacturers' instructions.

C. Store with seals and labels intact and legible.

D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.

E. For exterior storage of fabricated products, place on sloped supports above ground.

F. If approved by the Government, provide bonded off-site storage and protection when site does not permit on-site storage or protection.

G. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.

H. Comply with manufacturer's warranty conditions, if any.

I. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

J. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

K. Prevent contact with material that may cause corrosion, discoloration, or staining.

L. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

M. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

N. Store heavy materials away from the Project structure in a manner that will not endanger the supporting construction.

O. Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces.

P. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other losses.

Q. Store heavy materials away from the Project structure in a manner that will not endanger the supporting construction.

END OF SECTION

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SECTION 016116 - VOLATILE ORGANIC COMPOUND (VOC) CONTENT RESTRICTIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. VOC restrictions for product categories listed below under "DEFINITIONS."

B. All products of each category that are installed in the project must comply; The Government's project goals do not allow for partial compliance.

1.02 RELATED REQUIREMENTS

A. Section 01 3001 - Submittals: Submittal procedures.

B. Section 01 3225 - Project Sustainability Summary.

C. Section 01 3329 - Sustainable Design Reporting.

D. Section 014000 - Quality Requirements: Procedures for testing and certifications.

E. Section 015719 - Temporary Environmental Controls: Procedures and testing.

F. Section 016000 - Product Requirements: Fundamental product requirements, substitutions and product options, delivery, storage, and handling.

1.03 DEFINITIONS

A. VOC-Restricted Products: All products of each of the following categories when installed or applied on-site in the building interior:

1. Adhesives, sealants, and sealer coatings.
2. Carpet.
3. Carpet cushion.
4. Carpet tile.
5. Resilient floor coverings.
6. Wood flooring.
7. Paints and coatings.

8. Insulation.
9. Gypsum board.
10. Acoustical ceilings and panels.
11. Cabinet work.
12. Wall coverings.
13. Composite wood and agrifiber products used either alone or as part of another product.
14. Other products when specifically stated in the specifications.

B. Interior of Building: Anywhere inside the exterior weather barrier.

C. Adhesives: All gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.

D. Sealants: All gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.

1.04 REFERENCE STANDARDS

A. CAL (CHPS LEM) - Low-Emitting Materials Product List; California Collaborative for High Performance Schools (CHPS); current edition at www.chps.net/.

B. CAL (CDPH SM) - Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers Version 1.2 2017.

C. CRI (GLCC) - Green Label Testing Program - Approved Product Categories for Carpet Cushion; Carpet and Rug Institute; Current Edition.

D. CRI (GLP) - Green Label Plus Testing Program - Certified Products Current Edition.

E. UL (GGG) - GREENGUARD Gold Certified Products; UL Environment; current listings at http://http://productguide.ulenvironment.com/QuickSearch.aspx.

F. GreenSeal GS-36 - Standard for Adhesives for Commercial Use 2013.

G. SCAQMD 1168 - Adhesive and Sealant Applications 1989, with Amendment (2022).

H. SCS (CPD) - SCS Certified Products Current Edition.

I. ASHRAE 189.1 - Standard for the Design of High-Performance Green Buildings

1.05 SUBMITTALS

A. See Section 01 3001 - Submittals, for submittal procedures.

B. Evidence of Compliance: Submit for each different product in each applicable category.

C. Product Data: For each VOC-restricted product used in the project, submit evidence of compliance.

PART 2 PRODUCTS

2.01 MATERIALS

A. All VOC-Restricted Products: Provide products having VOC content of types and volume not greater than those specified in State of California Department of Health Services Standard Practice for the Testing of Volatile Organic Emissions From Various Sources Using Small-Scale Environmental Chambers.

1. Evidence of Compliance: Acceptable types of evidence are:

a. Current GREENGUARD Children & Schools certification; www.greenguard.org.

b. Current Carpet and Rug Institute Green Label Plus certification; www.carpet-rug.org.

c. Current SCS Floorscore certification; www.scscertified.com.

d. Current SCS Indoor Advantage Gold certification; www.scscertified.com.

e. Product listing in the CHPS Low-Emitting Materials Product List at www.chps.net/manual/lem_table.htm.

f. Current certification by any other agencies acceptable to CHPS.

g. Report of laboratory testing performed in accordance with CHPS requirements for getting a product listed in the Low-Emitting Materials Product List; report must include laboratory's statement that the product meets the specified criteria.

B. Adhesives and Joint Sealants: Provide only products having volatile organic compound (VOC) content not greater than required by South Coast Air Quality Management District Rule No.1168.

1. Evidence of Compliance: Acceptable types of evidence are:

a. Report of laboratory testing performed in accordance with requirements.

b. Published product data showing compliance with requirements.

c. Certification by manufacturer that product complies with requirements.

C. Aerosol Adhesives: Provide only products having volatile organic compound (VOC) content not greater than required by GreenSeal GS-36.

1. Evidence of Compliance: Acceptable types of evidence are:

a. Current GreenSeal Certification.

b. Report of laboratory testing performed in accordance with GreenSeal GS-36 requirements.

c. Published product data showing compliance with requirements.

D. Paints and Coatings:

1. Provide coatings that comply with the most stringent requirements specified in the following:

a. Provide flat and non flat top coats, primers, under coats, and anti-corrosive coatings products having volatile organic compounds (VOC) content not greater than required by Green Seal Standard GS-11

b. Concrete/masonry sealers (waterproofing concrete/masonry sealers), concrete curing compounds, dry fog coatings, faux finishing coatings, fire resistive coatings, floor coatings, graphic arts (sign) coatings, pretreatment wash primers, reactive penetrating sealers, recycled coatings, shellacs (clear and opaque), specialty primers, stains, wood coatings (clear and opaque), specialty primers, stains, wood coatings (clear wood finishes), wood preservatives, and zinc primer products having volatile organic compounds (VOC) content not greater than required by California Air Resources Board Suggested Control Measure for Architectural Coatings or SCAQMD Rule 1113

c. Basement specialty coatings, high-temperature coatings, low solids coatings, stone consolidants, swimming-pool coatings, tub- and tile-refining coatings, and waterproofing membrane products having volatile organic compounds (VOC) content not greater than required by California Air Resources Board Suggested Control Measure for Architectural Coatings.

d. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.

e. Ozone Transport Commission (OTC) Model Rule, Architectural, Industrial, and Maintenance Coatings; www.otcair.org; specifically:

2. Determination of VOC Content:

a. Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

3. Evidence of Compliance: Acceptable types of evidence are:

a. Report of laboratory testing performed in accordance with requirements.

b. Published product data showing compliance with requirements.

c. Certification by manufacturer that product complies with requirements.

E. Carpet Cushion: Provide products having VOC content not greater than that required for CRI Green Label certification.

1. Evidence of Compliance: Acceptable types of evidence are:

a. Current Green Label Certification.

b. Report of laboratory testing performed in accordance with requirements.

F. Carpet Tile and Adhesive: Provide products having VOC content not greater than that required for CRI Green Label Plus certification.

1. Evidence of Compliance: Acceptable types of evidence are:

a. Current Green Label Plus Certification.

b. Report of laboratory testing performed in accordance with requirements.

G. Composite Wood, Wood Structural Panel, and Agrifiber Products: Provide products that comply with one of the following:

1. Third-party certification shall be submitted indicating compliance with the California Air Resource Board's (CARB) Regulation, Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products. Third-party certifier shall be approved by CARB.

2. CDPH/EHLB/Standard Method V1.1 (commonly referred to as California Section 01350) and shall comply with the limit requirements for either office or classroom spaces

3. Evidence of Compliance: Acceptable types of evidence are:

   a. Published product data showing compliance with requirements.

PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL

A. The Government reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to the Government

B. Additional costs to restore indoor air quality due to installation of non-compliant products will be borne by Contractor.

END OF SECTION

SECTION 017000 - EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.

B. Dust Control.

C. Pre-installation meetings.

D. Cutting and patching.

E. Surveying for laying out the work.

F. Cleaning and protection.

G. Starting of systems and equipment.

H. Demonstration and instruction of Government personnel.

I. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.

J. General requirements for maintenance service.

1.02 RELATED REQUIREMENTS

A. Section 01 0102 Projection Information & Summary

B. Section 01 3001 - Submittals: Submittals procedures, Electronic document submittal service.

C. Section 01 3325 - Project Sustainability Summary

D. Section 01 3329 - Sustainable Design Reporting

E. Section 014000 - Quality Requirements: Testing and inspection procedures.

F. Section 015100 - Temporary Utilities: Temporary heating, cooling, and ventilating facilities.

G. Section 017800 - Closeout Submittals: Project record documents, operation and maintenance data, warranties, and bonds.

H. Section 017900 - Demonstration and Training: Demonstration of products and systems to be commissioned and where indicated in specific specification sections

I. Section 024100 - SELECTIVE DEMOLITION: Demolition of whole structures and parts thereof; site utility demolition.

1.03 REFERENCE STANDARDS

A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations 2022, with Errata (2021).

1.04 SUBMITTALS

A. See Section 01 3001 - Submittals for submittal procedures.

B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.

1. On request, submit documentation verifying accuracy of survey work.

2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in compliance with Contract Documents.

3. Submit surveys and survey logs for the project record.

C. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:

1. Structural integrity of any element of Project.

2. Integrity of weather exposed or moisture resistant element.

3. Efficiency, maintenance, or safety of any operational element.

4. Visual qualities of sight exposed elements.

5. Work of the Government or separate Contractor.

D. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.05 QUALIFICATIONS

A. For demolition work, employ a firm specializing in the type of work required.

B. For surveying work, employ a land surveyor registered in the State in which the Project is located and acceptable to the Government. Submit evidence of surveyor's Errors and

Omissions insurance coverage in the form of an Insurance Certificate. Employ only individual(s) trained and experienced in collecting and recording accurate data relevant to ongoing construction activities,

C. For field engineering, employ a professional engineer of the discipline required for specific service on Project, licensed in the State in which the Project is located. Employ only individual(s) trained and experienced in establishing and maintaining horizontal and vertical control points necessary for laying out construction work on project of similar size, scope and/or complexity.

1.06 PROJECT CONDITIONS

A. Use of explosives is not permitted.

B. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.

C. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

D. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

E. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.

1. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.

2. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

3. Refer to division 31 specifications for additional requirements.

F. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.07 COORDINATION

A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

B. Notify affected utility companies and comply with their requirements.

C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

F. Coordinate completion and clean-up of work of separate sections.

G. After Government occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of the Government's activities.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

A. New Materials: As specified in product sections; match existing products and work for patching and extending work.

B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 016000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.

E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 PREINSTALLATION MEETINGS

A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.

B. Require attendance of parties directly affecting, or affected by, work of the specific section.

C. Notify the Government four days in advance of meeting date.

D. Prepare agenda and preside at meeting:

1. Review conditions of examination, preparation and installation procedures.

2. Review coordination with related work.

E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Contracting Officer, Contracting Officer Representative(s), other meeting participants, and those affected by decisions made.

3.04 LAYING OUT THE WORK

A. Verify locations of survey control points prior to starting work.

B. Promptly notify the Government of any discrepancies discovered.

C. Contractor shall locate and protect survey control and reference points.

D. Protect survey control points prior to starting site work; preserve permanent reference points during construction.

E. Promptly report to the Government the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.

F. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to the Government

G. Utilize recognized engineering survey practices.

H. Establish a minimum of two permanent bench marks on site, referenced to established control points. Record locations, with horizontal and vertical data, on project record documents.

I. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:

   1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.

   2. Grid or axis for structures.

   3. Building foundation, column locations, ground floor elevations.

J. Periodically verify layouts by same means.

K. Maintain a complete and accurate log of control and survey work as it progresses.

L. Building Lines and Levels: Locate and lay out batter boards for structures, building foundations, column grids and locations, floor levels and control lines and levels required for mechanical and electrical Work.

M. Site Improvements: Locate and lay out site improvements, including pavements, stakes for grading, fill and topsoil placement, utility slopes and invert elevations by instrumentation and similar appropriate means.

N. Existing utilities and equipment: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction. Furnish information necessary to adjust, move or relocate existing

structures, utility poles, lines, services or other appurtenances located in, or affected by construction. Coordinate with local authorities having jurisdiction with construction.

3.05 GENERAL INSTALLATION REQUIREMENTS

A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.

B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.06 CUTTING AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. Refer to specification section 01 0450 for additional requirements.

3.07 DUST CONTROL

A. The Contractor shall be responsible to provide continuous (7 days per week, 24 hours per day) fugitive dust control measures within the limits of the construction site, related sites and adjacent streets and roads. Dust control shall be provided for, but not be specifically limited to, the stabilization of unpaved roads, haul roads, access roads, spoil sites, borrow and material sources, excavations, embankments, stockpiles, and all other areas which become potential sources of dust as a result of construction activities.

B. In order to control fugitive dust emissions, Contractor shall apply the following procedures and techniques:

1. Cover loads of materials, debris and waste materials taken from construction sites as needed to suppress dust during transit.

2. Water down or apply other approved dust control measures to the construction site, haul roads and public access roads as needed to suppress dust.

3. All mud and dirt shall be removed from vehicles prior to entering a paved or graveled area or road. Any mud or dirt that is carried out onto paved or graveled surfaces shall be removed from surfaces immediately and no less than daily.

3.08 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.09 PROTECTION OF INSTALLED WORK

A. Protect installed work from damage by construction operations.

B. Provide special protection where specified in individual specification sections.

C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

G. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.10 SYSTEM STARTUP

A. Coordinate schedule for start-up of various equipment and systems.

B. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.

C. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

D. Verify that wiring and support components for equipment are complete and tested.

E. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.

F. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.

G. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.11 DEMONSTRATION AND INSTRUCTION

A. See Section 017900 - Demonstration and Training.

B. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Government personnel in detail to explain all aspects of operation and maintenance.

C. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

D. Demonstration to include identification of air filter locations and filter replacement procedures.

3.12 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.13 FINAL CLEANING

A. Execute final cleaning prior to final project assessment.

B. Use cleaning materials that are nonhazardous.

C. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.

D. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.

E. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

F. Clean filters of operating equipment.

G. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, drainage systems.

H. Clean site; sweep paved areas, rake clean landscaped surfaces.

I. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.14 CLOSEOUT PROCEDURES

A. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Beneficial Occupancy.

B. Refer to requirements of the contract for additional requirements.

C. Beneficial Occupancy

1. Notify the Government when work is considered ready for Beneficial Occupancy inspection.

2. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for the Government's beneficial occupancy inspection.

3. Notify the Government of intended date of Beneficial Occupancy as early as is feasibly possible. The Government will schedule Final Inspection of the work with the Contracting Officer, Contracting Officer's Representative(s), Architect, Architect's Consultants, Base Fire Department, and other required attendees.

4. Upon completion of the Final Inspection, if the work is deemed to have achieved beneficial occupancy, the Government will distribute a Certificate of Beneficial Occupancy with "Punch List" of items required to be corrected by the Contractor prior to Final Acceptance of the Work.

D. Final Acceptance

1. Correct items of work listed in executed Certificates of Beneficial Occupancy.

2. Notify the Contracting Officer Representative when work is considered finally complete.

3. Submit a certified copy of the Government's final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and the list has been endorsed and dated by the Contracting Officer Representative.

4. Upon completion of re-inspection, the Contracting Officer will prepare a certificate of final acceptance, or advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.

5. If necessary, re-inspection will be repeated until all items of work are completed.

6. Submit final meter readings for utilities and similar data as of the date of Beneficial Occupancy.

7. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

8. Submit the final payment request with releases and supporting documentation as outlined in the General Conditions of the Contract for Construction.

E. Conduct Beneficial Occupancy inspection and create Final Correction Punch List containing Government's and Contractor's comprehensive list of items identified to be completed or corrected and submit to the Contracting Officer.

3.15 MAINTENANCE

A. Provide service and maintenance of components indicated in specification sections.

B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Beneficial Occupancy or the length of the specified warranty, whichever is longer.

C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.

D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.

E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Government.

END OF SECTION

SECTION 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.01 WASTE MANAGEMENT REQUIREMENTS

A. The Government requires that this project generate the least amount of trash and waste possible.

B. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.

C. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.

D. Required Recycling, Salvage, and Reuse: The following may NOT be disposed of in landfills or by incineration:

1. Aluminum and plastic beverage containers.
2. Corrugated cardboard.
3. Wood pallets.
4. Clean dimensional wood: May be used as blocking or furring.
5. Land clearing debris, including brush, branches, logs, and stumps; see Section 311000 - Site Clearing for use options.
6. Concrete.
7. Bricks.
8. Concrete masonry units.
9. Asphalt paving.
10. Metals, including packaging banding, metal studs, sheet metal, structural steel, piping, reinforcing bars, door frames, and other items made of steel, iron, galvanized steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.
11. Glass.
12. Gypsum drywall and plaster.
13. Plastic buckets.

14. Carpet, carpet cushion, carpet tile, and carpet remnants , both new and removed: DuPont (http://flooring.dupont.com) and Interface (www.interfaceinc.com) conduct reclamation programs.

15. Paint.

16. Plastic sheeting.

17. Rigid foam insulation.

18. Windows, doors, and door hardware.

19. Plumbing fixtures.

20. Mechanical and electrical equipment.

21. Fluorescent lamps (light bulbs).

22. Acoustical ceiling tile and panels.

E. HPSB Compliance for this project is dependent on diversion of 60 percent, by weight or volume, of potential landfill trash/waste by recycling and/or salvage.

F. Contractor shall submit periodic Waste Disposal Reports; all landfill disposal, recycling, salvage, and reuse must be reported regardless of to whom the cost or savings accrues; use the same units of measure on all reports.

G. Contractor shall develop and follow a Waste Management Plan designed to implement these requirements.

H. Methods of trash/waste disposal that are not acceptable are:

1. Burning on the project site.

2. Burying on the project site.

3. Dumping or burying on other property, public or private.

4. Other illegal dumping or burying.

5. Incineration, either on- or off-site.

I. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

1.02 RELATED REQUIREMENTS

A. Section 01 3225 Project Sustainability Summary

B. Section 01 3329 Sustainable Design Reporting

C. See Section 01 3001 - Submittals: Additional requirements for project meetings, reports, submittal procedures and project documentation.

D. Section 015000 - Temporary Facilities and Controls: Additional requirements related to trash/waste collection and removal facilities and services.

E. Section 016000 - Product Requirements: Waste prevention requirements related to delivery, storage, and handling.

F. Section 017000 - Execution and Closeout Requirements: Trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

1.03 DEFINITIONS

A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.

B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.

C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.

D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.

E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.

F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.

G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.

H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does

not include burning, incinerating, or thermally destroying waste.

I. Return: To give back reusable items or unused products to vendors for credit.

J. Reuse: To reuse a construction waste material in some manner on the project site.

K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.

L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.

M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

N. Toxic: Poisonous to humans either immediately or after a long period of exposure.

O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.

P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.04 SUBMITTALS

A. See Section 01 3001 - Submittals, for submittal procedures.

B. HPSB Submittals: Submit Waste Management Plan and Waste Disposal Reports.

C. Submit Waste Management Plan within 10 calendar days after receipt of Notice of Award of Bid, or prior to any trash or waste removal, whichever occurs sooner; submit projection of all trash and waste that will require disposal and alternatives to landfilling.

D. Waste Management Plan: Include the following information:

1. Analysis of the trash and waste projected to be generated during the entire project construction cycle, including types and quantities.

2. Landfill Options: The name, address, and telephone number of the landfill(s) where trash/waste will be disposed of, the applicable landfill tipping fee(s), and the projected cost of disposing of all project trash/waste in the landfill(s).

3. Landfill Alternatives: List all waste materials that will be diverted from landfills by reuse, salvage, or recycling.

a. List each material proposed to be salvaged, reused, or recycled.

4. Meetings: Describe regular meetings to be held to address waste prevention, reduction, recycling, salvage, reuse, and disposal.

5. Materials Handling Procedures: Describe the means by which materials to be diverted from landfills will be protected from contamination and prepared for acceptance by designated facilities; include separation procedures for recyclables, storage, and packaging.

6. Transportation: Identify the destination and means of transportation of materials to be recycled; i.e. whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler.

7. Recycling Incentives: Describe procedures required to obtain credits, rebates, or similar incentives.

E. Waste Disposal Reports: Submit at specified intervals, with details of quantities of trash and waste, means of disposal or reuse, and costs; show both totals to date and since last report.

1. Submit updated Report with each Application for Progress Payment; failure to submit Report will delay payment.

2. Submit Report on a form acceptable to Contracting Officer.

3. Landfill Disposal: Include the following information:

   a. Identification of material.

   b. Amount, in tons or cubic yards (cubic meters), of trash/waste material from the project disposed of in landfills.

   c. State the identity of landfills, total amount of tipping fees paid to landfill, and total disposal cost.

   d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.

4. Recycled and Salvaged Materials: Include the following information for each:

   a. Identification of material, including those retrieved by installer for use on other projects.

   b. Amount, in tons or cubic yards (cubic meters), date removed from the project site, and receiving party.

c. Transportation cost, amount paid or received for the material, and the net total cost or savings of salvage or recycling each material.

d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.

e. Certification by receiving party that materials will not be disposed of in landfills or by incineration.

5. Material Reused on Project: Include the following information for each:

a. Identification of material and how it was used in the project.

b. Amount, in tons or cubic yards (cubic meters).

c. Include weight tickets as evidence of quantity.

6. Other Disposal Methods: Include information similar to that described above, as appropriate to disposal method.

1.05 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Waste Management Conference: Conduct conference at Project site. Review methods and procedures related to waste management including, but not limited to, the following:

1. Review and discuss waste management plan including responsibilities of Waste Management Coordinator as project requires.

2. Review requirements for documenting quantities of each type of waste and its disposition.

3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.

4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.

5. Review waste management requirements for each trade.

1.06 WASTE MANAGEMENT PLAN

A. General: Develop plan consisting of waste identification, waste reduction work plan, and cost/revenue analysis. Include separate sections in plan for demolition and construction waste. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.

B. Waste Identification: Indicate anticipated types and quantities of demolition, site-clearing, and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.

C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.

1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.

2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.

3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.

4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.

5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.

6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

D. Cost/Revenue Analysis: Indicate total cost of waste disposal as if there was no waste management plan and net additional cost or net savings resulting from implementing waste management plan. Include the following:

1. Total quantity of waste.

2. Estimated cost of disposal (cost per unit). Include hauling and tipping fees and cost of collection containers for each type of waste.

3. Total cost of disposal (with no waste management).

4. Revenue from salvaged materials.

5. Revenue from recycled materials.

6. Savings in hauling and tipping fees by donating materials.

7. Savings in hauling and tipping fees that are avoided.

8. Handling and transportation costs. Include cost of collection containers for each type of waste.

9. Net additional cost or net savings from waste management plan.

PART 2 PRODUCTS - NOT APPLICABLE

PART 3 EXECUTION

3.01 WASTE MANAGEMENT PROCEDURES

A. See Section 01 3001 - Submittals, for additional requirements for project meetings, reports, submittal procedures, and project documentation.

B. See Section 015000 for additional requirements related to trash/waste collection and removal facilities and services.

C. See Section 016000 for waste prevention requirements related to delivery, storage, and handling.

D. See Section 017000 for trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

3.02 WASTE MANAGEMENT PLAN IMPLEMENTATION

A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.

B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Government, and Architect.

C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate

stages of the project.

D. Meetings: Discuss trash/waste management goals and issues at project meetings.

1. Pre-bid meeting.

2. Pre-construction meeting.

3. Regular job-site meetings.

E. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.

1. As a minimum, provide:

a. Separate area for storage of materials to be reused on-site, such as wood cut-offs for blocking.

b. Separate dumpsters for each category of recyclable.

c. Recycling bins at worker lunch area.

2. Provide containers as required.

3. Locate enclosures out of the way of construction traffic.

4. Provide adequate space for pick-up and delivery and convenience to subcontractors.

5. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.

F. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.

G. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.

H. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.

I. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

END OF SECTION

SECTION 017800 - CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project Record Documents.

B. Operation and Maintenance Data.

C. Warranties and bonds.

1.02 RELATED REQUIREMENTS

A. Section 01 3001 - Submittals: Submittals procedures, shop drawings, product data, and samples.

B. Section 01 3325 - Project Sustainability Summary

C. Section 01 3329 - Sustainable Design Reporting

D. Section 017000 - Execution and Closeout Requirements: Contract closeout procedures.

E. Individual Product Sections: Specific requirements for operation and maintenance data.

F. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

A. Project Record Documents: Submit documents to the Government with claim for final Application for Payment.

B. Operation and Maintenance Data:

1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. The Contracting Officer Representative will review draft and return one copy with comments.

2. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Government comments. Revise content of all document sets as required prior to final submission.

3. Submit two sets of revised final documents in final form within 10 days after final inspection.

C. Warranties and Bonds:

1. Make other submittals within 10 days after Date of Beneficial Occupancy, prior to final Application for Payment.

2. For items of Work for which acceptance is delayed beyond Date of Beneficial Occupancy, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:

1. Drawings.

2. Specifications.

3. Addenda.

4. Change Orders and other modifications to the Contract.

5. Reviewed shop drawings, product data, and samples.

6. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by the Government.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress.

E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:

1. Manufacturer's name and product model and number.

2. Product substitutions or alternates utilized.

3. Changes made by Addenda and modifications.

F. Record Drawingsand Shop Drawings: Legibly mark each item to record actual construction including:

1. Field changes of dimension and detail.

2. Details not on original Contract drawings.

G. The Government will review project record documents on a monthly basis to ensure changes in the work are being accurately recorded.

3.02 OPERATION AND MAINTENANCE DATA

A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

C. 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.

D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

A. For Each Product, Applied Material, and Finish:

1. Product data, with catalog number, size, composition, and color and texture designations.

2. Information for re-ordering custom manufactured products.

B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.

C. Additional information as specified in individual product specification sections.

D. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

E. Provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

A. For Each Item of Equipment and Each System:

1. Description of unit or system, and component parts.
2. Identify function, normal operating characteristics, and limiting conditions.
3. Include performance curves, with engineering data and tests.
4. Complete nomenclature and model number of replaceable parts.

B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

C. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

D. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

E. Provide servicing and lubrication schedule, and list of lubricants required.

F. Include manufacturer's printed operation and maintenance instructions.

G. Include sequence of operation by controls manufacturer.

H. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

I. Provide control diagrams by controls manufacturer as installed.

J. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

K. Include test and balancing reports.

L. Additional Requirements: As specified in individual product specification sections.

3.05 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

A. Assemble operation and maintenance data into durable manuals for Government personnel use, with data arranged in the same sequence as, and identified by, the specification sections.

B. Where systems involve more than one specification section, provide separate tabbed divider for each system.

C. Prepare instructions and data by personnel experienced in maintenance and operation of described products.

D. Prepare data in the form of an instructional manual.

E. Binders: Commercial quality, 8-1/2 by 11 inch (216 by 280 mm) three D side ring binders with durable plastic covers; 3 inch (76 mm) maximum ring size. When multiple binders are used, correlate data into related consistent groupings.

F. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.

G. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible parties.

H. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.

I. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.

J. Text: Manufacturer's printed data, or typewritten data on 20 pound paper.

K. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

L. Arrange content by systems under section numbers and sequence of Table of Contents of this Project Manual.

M. Contents: Prepare a Table of Contents for each volume, with each product or system description identified, in three parts as follows:

1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect, Contractor, Subcontractors, and major equipment suppliers.

2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:

a. Significant design criteria.

b. List of equipment.

c. Parts list for each component.

d. Operating instructions.

e. Maintenance instructions for equipment and systems.

f. Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.

3. Part 3: Project documents and certificates, including the following:

a. Shop drawings and product data.

b. Certificates.

c. Photocopies of warranties and bonds.

N. Provide a listing in Table of Contents for design data, with tabbed dividers and space for insertion of data.

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

P. Combine all of the above listed documents into a tabbed and organized electronic file in .pdf format for review. Update the electronic file as requested by the Government until documents are complete and acceptable to the Government. Following acceptance of the electronic file, print and bind one hard copy, as described above, and deliver it to the Government.

3.06 WARRANTIES AND BONDS

A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with the Government's permission, leave date of beginning of time of warranty until Date of Beneficial Occupancy is determined.

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.

E. Manual: Bind in commercial quality 8-1/2 by 11 inch (216 by 279 mm) three D side ring binders with durable plastic covers.

F. Cover: Identify each binder with typed or printed title WARRANTIES AND BONDS, with title of Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible company principal.

G. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.

H. Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

I. Combine all of the above listed documents into a tabbed and organized electronic file in .pdf format for review. Update the electronic file as requested by the Government until documents are complete and acceptable to the Government. Following acceptance of the electronic file, print and bind one hard copy, as described above, and deliver it to the Government.

3.07 SUSTAINABILITY DOCUMENTATION

A. Refer to section 01 3329 Sustainable Design Reporting.

B. Contractor to submit all required sustainability documentation prior to project closeout.

END OF SECTION

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SECTION 017900 - DEMONSTRATION AND TRAINING

PART 1 GENERAL

1.01 SUMMARY

A. Demonstration of products and systems to be commissioned and where indicated in specific specification sections.

B. Training of Government personnel in operation and maintenance is required for:

1. All software-operated systems.
2. HVAC systems and equipment.
3. Plumbing equipment.
4. Electrical Systems and equipment.
5. Items specified in individual product Sections.

C. Training of Government personnel in care, cleaning, maintenance, and repair is required for:

1. Roofing, waterproofing, and other weather-exposed or moisture protection products.
2. Finishes, including flooring, wall finishes, ceiling finishes.
3. Fixtures and fittings.
4. Items specified in individual product Sections.

1.02 RELATED REQUIREMENTS

A. Section 017800 - Closeout Submittals: Operation and maintenance manuals.

B. Section 01 9100.15 - Total Building Commissioning: Additional requirements applicable to demonstration and training.

C. Other Specification Sections: Additional requirements for demonstration and training.

1.03 SUBMITTALS

A. See Section 01 3001 - Submittals for submittal procedures; except:

1. Make all submittals specified in this section, and elsewhere where indicated for commissioning purposes, directly to the Commissioning Authority.

2. Submit one copy to the Commissioning Authority, not to be returned.

3. Make commissioning submittals on time schedule specified by Commissioning Authority.

4. Submittals indicated as "Draft" are intended for the use of the Commissioning Authority in preparation of overall Training Plan; submit in editable electronic format, Microsoft Word 2003 preferred.

B. Draft Training Plans: The Government will designate personnel to be trained; tailor training to needs and skill-level of attendees.

1. Submit to Commissioning Authority for review and inclusion in overall training plan.

2. Submit not less than four weeks prior to start of training.

3. Revise and resubmit until acceptable.

4. Provide an overall schedule showing all training sessions.

5. Include at least the following for each training session:

a. Identification, date, time, and duration.

b. Description of products and/or systems to be covered.

c. Name of firm and person conducting training; include qualifications.

d. Intended audience, such as job description.

e. Objectives of training and suggested methods of ensuring adequate training.

f. Methods to be used, such as classroom lecture, live demonstrations, hands-on, etc.

g. Media to be used, such a slides, hand-outs, etc.

h. Training equipment required, such as projector, projection screen, etc., to be provided by Contractor.

C. Training Manuals: Provide training manual for each attendee; allow for minimum of two attendees per training session.

1. Include applicable portion of O&M manuals.
2. Include copies of all hand-outs, slides, overheads, video presentations, etc., that are not included in O&M manuals.
3. Provide one extra copy of each training manual to be included with operation and maintenance data.

D. Training Reports:

1. Identification of each training session, date, time, and duration.
2. Sign-in sheet showing names and job titles of attendees.
3. List of attendee questions and written answers given, including copies of and references to supporting documentation required for clarification; include answers to questions that could not be answered in original training session.
4. Include Commissioning Authority's formal acceptance of training session.

E. Video Recordings: Submit digital video recording of each demonstration and training session for the Government's subsequent use.

1. Format: DVD Disc.
2. Label each disc and container with session identification and date.

1.04 QUALITY ASSURANCE

A. Instructor Qualifications: Familiar with design, operation, maintenance and troubleshooting of the relevant products and systems.

1. Provide as instructors the most qualified trainer of those contractors and/or installers who actually supplied and installed the systems and equipment.
2. Where a single person is not familiar with all aspects, provide specialists with necessary qualifications.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 DEMONSTRATION - GENERAL

A. Demonstrations conducted during system start-up do not qualify as demonstrations for the purposes of this section, unless approved in advance by the Government

B. Demonstrations conducted during Functional Testing need not be repeated unless Government personnel training is specified.

C. Demonstration may be combined with Government personnel training if applicable.

D. Operating Equipment and Systems: Demonstrate operation in all modes, including start-up, shut-down, seasonal changeover, emergency conditions, and troubleshooting, and maintenance procedures, including scheduled and preventive maintenance.

1. Perform demonstrations not less than two weeks prior to Beneficial Occupancy.

2. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

E. Non-Operating Products: Demonstrate cleaning, scheduled and preventive maintenance, and repair procedures.

1. Perform demonstrations not less than two weeks prior to Beneficial Occupancy.

3.02 TRAINING - GENERAL

A. Commissioning Authority will prepare the Training Plan based on draft plans submitted.

B. Conduct training on-site unless otherwise indicated.

C. The Government will provide classroom and seating at no cost to Contractor.

D. Do not start training until Functional Testing is complete, unless otherwise specified or approved by the Commissioning Authority.

E. Provide training in minimum two hour segments.

F. The Commissioning Authority is responsible for determining that the training was satisfactorily completed and will provide approval forms.

G. Training schedule will be subject to availability of Government personnel to be trained; re-schedule training sessions as required by the Government; once schedule has been approved by the Government failure to conduct sessions according to schedule will be cause for the Government to charge Contractor for personnel "show-up" time.

H. Training schedule will be subject to availability of Government personnel to be trained; re-schedule training sessions as required by the Government.

I. Review of Facility Policy on Operation and Maintenance Data: During training discuss:

1. The location of the O&M manuals and procedures for use and preservation; backup copies.
2. Typical contents and organization of all manuals, including explanatory information, system narratives, and product specific information.
3. Typical uses of the O&M manuals.

J. Product- and System-Specific Training:

1. Review the applicable O&M manuals.
2. For systems, provide an overview of system operation, design parameters and constraints, and operational strategies.
3. Review instructions for proper operation in all modes, including start-up, shut-down, seasonal changeover and emergency procedures, and for maintenance, including preventative maintenance.
4. Provide hands-on training on all operational modes possible and preventive maintenance.
5. Emphasize safe and proper operating requirements; discuss relevant health and safety issues and emergency procedures.
6. Discuss common troubleshooting problems and solutions.
7. Discuss any peculiarities of equipment installation or operation.
8. Discuss warranties and guarantees, including procedures necessary to avoid voiding coverage.
9. Review recommended tools and spare parts inventory suggestions of manufacturers.
10. Review spare parts and tools required to be furnished by Contractor.
11. Review spare parts suppliers and sources and procurement procedures.

K. Be prepared to answer questions raised by training attendees; if unable to answer during training session, provide written response within three days.

END OF SECTION

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SECTION 01 9100.15 TOTAL BUILDING COMMISSIONING

PART 1 GENERAL

1.1 SUMMARY

A. Commissioning is intended to achieve the following specific objectives; this section specifies the Contractor's responsibilities for commissioning:
   1. Verify that the work is installed in accordance with Contract Documents and the manufacturer's recommendations and instructions, and that it receives adequate operational checkout prior to startup: Startup reports and Prefunctional Checklists executed by the Commissioning Provider (CxP) and assisted by the Contractor are utilized to achieve this.
   2. Verify and document that functional performance is in accordance with Contract Documents: Functional Tests executed by the CxP and assisted, as necessary, by the Contractor are utilized to achieve this.
   3. Verify that operation and maintenance manuals submitted to the Government are complete: Detailed operation and maintenance (O&M) data submittals by Contractor are utilized to achieve this.
   4. Verify that the Government operating personnel are adequately trained: Formal training conducted by Contractor is utilized to achieve this.

B. Commissioning, including Functional Tests, O&M documentation review, and training, is to occur after startup and initial checkout and be completed before Beneficial Occupancy and Functional Completion.

C. The Commissioning Authority directs and coordinates all commissioning activities; this section describes some but not all of the Commissioning Authority's responsibilities.

D. The Commissioning Authority is employed by the Government
   1. The contractor will be accountable for those responsibilities outlined in specification section 01 9100.15 – Total Building Commissioning, and for compliance with the Commissioning Plan and correction of deficiencies, reinspection, and re-testing, as applicable at no extra cost to the Government.

1.2 SYSTEMS TO BE COMMISSIONED

Commission the following systems:

Commission 100% of the mechanical equipment installed on this project including:
- Heating, Ventilating, Air Conditioning, and Refrigeration Systems (HVAC)
- Plumbing / Domestic, Process and Service Water Heating Systems
- Water & Energy Measurement Devices
- Electrical Systems/ Lighting / UPS

- Building Automation System

1.3 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS (ASHRAE)

ASHRAE 202	(2018) Commissioning Process for Buildings and Systems

ASSOCIATED AIR BALANCE COUNCIL (AABC)

ACG Commissioning Guideline	(2005) Commissioning Guideline

NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB)

NEBB Commissioning Standard	(2009) Procedural Standards for Whole Building Systems Commissioning of New Construction; 3rd Edition

SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)

ANSI/SMACNA 014	(2013) HVAC Systems Commissioning Manual, 2nd Edition

1.4 COMMUNICATION WITH THE GOVERNMENT

The Lead Commissioning Specialist (CxC) must submit all plans, schedules, reports, and documentation directly to the Contracting Officer Representative concurrent with submission to the CQC System Manager. The Lead Commissioning Specialist must have direct communication with the Contracting Officer's Representative regarding all elements of the commissioning process; however, the Government has no direct contract authority with the Lead Commissioning Specialist.

1.5 SEQUENCING AND SCHEDULING

1.5.1 Sequencing

Complete the following prior to starting Functional Performance Tests of mechanical systems:

a. All equipment and systems have been completed, cleaned, flushed, disinfected, calibrated, tested, and operate in accordance with contract documents and construction plans and specifications.

b. Performance Verification Tests of the controls systems have been completed and the Performance Verification Test Report has been submitted and approved in accordance with Specification Section 23 0900 INSTRUMENTATION AND CONTROL FOR HVAC.

c. Testing, Adjusting, and Balancing has been completed and the Testing, Adjusting, and Balancing Report, has been submitted and approved in accordance with Specification Section 23 0593 TESTING, ADJUSTING, AND BALANCING FOR HVAC.

d. The building envelope is enclosed according to contract documents with final construction completed.

e. The Pre-Functional Checklists have been submitted and approved.

f. The Certificate of Readiness for mechanical systems has been submitted and approved.

1.5.2 Project Schedule

Include the following tasks in the project schedule. Ensure sufficient time is scheduled to accommodate the requirements of this specification section. The order of items listed below is not intended to imply a specified sequence:

a. Submission and approval of the Commissioning Firm and Commissioning Specialist

b. Submission and approval of the Testing, Adjusting, and Balancing (TAB) Firm and TAB Specialist specified in Specification Section 23 0593 TESTING, ADJUSTING, AND BALANCING FOR HVAC

c. Submission and approval of the Commissioning Plan

d. Installation of permanent utilities (gas, water, electric)

e. Factory Acceptance Testing for each of the systems to be commissioned as required by technical specifications

f. Manufacturer's Equipment Start-Up for each of the systems to be commissioned.

g. Submission and approval of the TAB Schematic Drawings, Report Forms, and Procedures specified in Specification Section 23 0593 TESTING, ADJUSTING, AND BALANCING FOR HVAC.

h. Testing, Adjusting, and Balancing (TAB) Field Work required by Specification Section 23 0593 TESTING, ADJUSTING, AND BALANCING FOR HVAC

i. Submission and approval of the TAB Report specified in Specification Section 23 0593 TESTING, ADJUSTING, AND BALANCING FOR HVAC

j. TAB Field Acceptance Testing required by Specification Section 23 0593 TESTING, ADJUSTING, AND BALANCING FOR HVAC

k. Performance Verification Test Report specified in Specification Section 23 0900 INSTRUMENTATION AND CONTROL FOR HVAC.

l. Pre-Functional Checklist Submittal

m. Functional Performance Testing for each system to be commissioned

n. Post-Test Deficiency Correction for each system to be commissioned

o. Re-Testing

p. Training for each of the systems to be commissioned

q. Submission and approval of the Commissioning Report

1.6 SUBMITTALS

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are for Contractor Quality Control approval. Submit the following in accordance with Section 01 3001 SUBMITTALS:

SD-01 Preconstruction Submittals

Commissioning Firm; G

Lead Commissioning Specialist; G

Technical Commissioning Specialists; G

SD-06 Test Reports

Commissioning Plan; G

Pre-Functional Checklists; G

Issues Log

Commissioning Report; G

SD-07 Certificates

Certificate of Readiness; G

SD-10 Operation and Maintenance Data

Training Plan; G, RO

Training Attendance Rosters; G, RO

SD-11 Closeout Submittals

Final Commissioning Report

1.7 COMMISSIONING FIRM

Provide a Commissioning Firm that is certified in commissioning by one of the following: the AABC Commissioning Group (ACG); the National Environmental Balancing Bureau (NEBB); the International Certification Board/Testing, Adjusting, and Balancing Bureau (ICB/TABB), the Building Commissioning Association (BCA); the Association of Energy Engineers (AEE). The Commissioning Firm must be certified in all systems to be commissioned to the extent such certifications are available from the certifying body. Describe any lapses in certification or disciplinary action taken by the certifying body against the proposed Commissioning Firm or Lead Commissioning Specialist in detail. Any firm or certified commissioning professional that has been the subject of disciplinary action by the certifying body within the five years preceding contract award is not eligible to perform any duties related to building systems commissioning.

a. Submit the Commissioning Firm's certification of qualifications including the name of the firm and certifications no later than 30 calendar days after Notice to Proceed. Submit one hard copy and an electronic copy.

b. The Commissioning Firm's and Commissioning Specialists' certifications must be maintained for the entire duration of the duties specified herein. If, for any reason, the firm or a specialist loses a certification during this period, immediately notify the Contracting Officer's Representative and submit another Commissioning Firm or Commissioning Specialist for approval. All work specified in this specification section performed by the Commissioning Firm or associated Commissioning Specialists is invalid if the Commissioning Firm or Commissioning Specialist loses its certification prior to contract completion and must be performed by an approved successor.

c. The Commissioning Firm must oversee and assist the General or Prime Contractor with the work specified herein.

1.7.1 Lead Commissioning Specialist

The Commissioning Firm must provide a Lead Commissioning Specialist (CxC) that has a minimum of five years of commissioning experience, including two projects of similar size and complexity, and that is one of the following: a NEBB qualified Systems Commissioning Administrator (SCA); ACG Certified Commissioning Authority (CxA); ICB/TABB Certified Commissioning Supervisor; BCA Certified Commissioning Professional (CCP); AEE Certified Building Commissioning Professional (CBCP); University of Wisconsin-Madison Qualified Commissioning Process Provider (QCxP); Building Commissioning Professional (BCxP).

a. Submit the Lead Commissioning Specialist's certification of qualifications including the name of the specialist and firm; certifications; years of experience; and a listing of representative projects of similar size and complexity no later than 30 calendar days after Notice to Proceed. Submit one hard copy and an electronic copy.

b. The Lead Commissioning Specialists certifications must be maintained for the entire duration of the duties specified herein. If, for any reason, the specialist loses a certification during this period, immediately notify the Contracting Officer's Representative and submit another Lead Commissioning Specialist for approval. All work specified in this specification section to be performed by the Lead Commissioning Specialist is invalid if the Lead Commissioning Specialist loses its certification prior to contract completion and must be performed by an approved successor.

c. The Lead Commissioning Specialist must lead and oversee the commissioning work specified herein and be the primary point of contact for the Government regarding the commissioning work. One of the Technical Commissioning Specialists may be the Lead Commissioning Specialist provided that all of the qualification requirements are met.

1.7.2 Technical Commissioning Specialists

Technical Commissioning Specialists, employed by the Commissioning Firm and that have the following qualifications, must perform the technical work specified herein associated with each system to be commissioned:

a. Mechanical Technical Commissioning Specialist: The technical work associated with mechanical systems including Heating, Ventilating, Air Conditioning, and Refrigeration Systems; Building Automation System; must be performed by a Commissioning Specialist certified by NEBB, ACG, ICB/TABB, or BCA in the commissioning of HVAC systems with five years of experience in the commissioning of HVAC systems.

b. Submit the Technical Commissioning Specialist's certification of qualifications including the name of the specialist and firm; certifications; years of experience; and a listing of representative projects of similar size and complexity no later than 30 calendar days after Notice to Proceed. Submit one hard copy and an electronic copy.

1.7.3 Commissioning Standard

Comply with the requirements of the commissioning standard under which the Commissioning Firm and Specialists qualifications are approved. When the firm and specialists are certified by BCA, AEE, ASHRAE, or the University of Wisconsin-Madison, comply with the requirements of one of the acceptable standards unless otherwise stated herein. The acceptable standards are ACG Commissioning Guideline, NEBB Commissioning Standard, ANSI/SMACNA 014, or ASHRAE 202. Comply with applicable NETA testing standards for electrical systems.

a. Implement all recommendations and suggested practices contained in the Commissioning Standard and electrical test standards.

b. Use the Commissioning Standard for all aspects of Commissioning, including calibration of instruments.

c. Where the instrument manufacturer calibration recommendations are more stringent than those listed in the Commissioning Standard, adhere to the manufacturer calibration recommendations.

d. All quality assurance provisions of the Commissioning Standard such as performance guarantees are part of this contract.

e. The Commissioning Specialists must develop commissioning procedures for any systems or system components not covered in the Commissioning Standard.

f. Use any new requirements, recommendations, and procedures published or adopted prior to contract solicitation by the body responsible for the Commissioning Standard.

1.8 ISSUES LOG

The Lead Commissioning Specialist must develop and maintain an Issues Log for tracking and resolution of all deficiencies discovered through submittal reviews, inspection, and testing. Include the date of final resolution of issues as confirmed by the Commissioning Specialist. Submit the Issues Log on a monthly basis at a minimum. At any point during construction, any commissioning team member finding deficiencies may communicate those deficiencies in writing to the Commissioning Specialist for inclusion into the Issues Log.

1.9 CERTIFICATE OF READINESS

Prior to scheduling Functional Performance Tests for each system, issue a Certificate of Readiness for the system certifying that the system is ready for Functional Performance Testing. The Certificate of Readiness must include, for each system to be commissioned, all equipment and system start-up reports; Performance Verification Test Reports; completed Pre-Functional Checklists; Testing, Adjusting, and Balancing (TAB) Report; HVAC Controls Start-Up Reports to the extent applicable to the system. The Contractor; the Lead Commissioning Specialist; the Contractor's Quality Control Representative; the Mechanical, Electrical, Controls, and TAB subcontractor representatives must sign and date the Certificate of Readiness. Submit the Certificate of Readiness for each system no later than 14 calendar days prior to Functional Performance Tests of that system. Submit one hard copy and an electronic copy. Do not schedule Functional Performance Tests for a system until the Certificate of Readiness for that system receives approval by the Government.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

3.1 CONSTRUCTION PHASE

3.1.1 Construction Commissioning Coordination Meeting

The Lead Commissioning Specialist must lead a Construction Commissioning Coordination Meeting no later than 14 days after approval of the Commissioning Firm and Commissioning Specialists to discuss the commissioning process including contract requirements, lines of communication, roles and responsibilities, schedules, documentation requirements, inspection and test procedures, and logistics as specified in this specification section. The Contractor's Superintendent or Project Manager, the Contractor's Quality Control Representative, and the Government must attend this meeting. Invite the User and a Base Civil Engineer Office Representative to attend this meeting.

3.1.2 Construction Phase Commissioning Plan

3.1.2.1 Final Construction Phase Commissioning Plan

The Lead Commissioning Specialist (CxC) must prepare the Final Construction Phase Commissioning Plan. Submit the Final Construction Phase Commissioning Plan no later than 30 calendar days prior to the start of Pre-Functional Checks. Submit one hard copy and an electronic copy. Once approved, file the approved plan in the Sustainability eNotebook.

Include the information provided in the Interim Construction Phase Commissioning Plan. In addition, the Technical Commissioning Specialist must develop the Pre-Functional Checklists and Functional Performance Test Checklists for each building, for each system required to be

commissioned, and for each component for inclusion in the Final Construction Phase Commissioning Plan.

3.1.2.1.1 Pre-Functional Checklists

The Pre-Functional Checklists must include items for physical inspection or testing that demonstrate that installation and start-up of equipment and systems is complete. Refer to paragraph Pre-Functional Checks for more information.

3.1.2.1.2 Functional Performance Test Checklists

Functional Performance Test Checklists must include procedures that explain, step-by-step, the actions and expected results that will demonstrate that the system performs in accordance with the contract. Refer to paragraph Functional Performance Tests for more information. Include the following sections and details appropriate to the systems being tested in the Functional Performance Test Checklists:

a. Notable system features including information about controls to facilitate understanding of system operation

b. Conclusions and recommendations. Conclusions must clearly indicate if system does or does not perform in accordance with contract requirements. Recommendation must clearly indicate that the system should or should not be accepted by the Government.

c. Test conditions including date, beginning and ending time, and beginning and ending outdoor air conditions

d. Attendees

e. Identification of the equipment involved in the test

f. Control system feature identification

g. Point-to-point observations including demonstrating system flow meters and sensors have been calibrated and are correctly displayed on the Operator work station

h. Actuator operation observations demonstrating actuator responses to commands from the control system

i. As-found condition of the system operation

j. List of test items with step numbers along with the corresponding feature or control operation, intended test procedure, expected system response, and pass/fail indication.

k. Space for comments for each test item.

3.1.3 Construction Submittals

Provide all submittals associated with the systems to be commissioned, including shop drawings; equipment submittals; test plans, procedures, and reports; and resubmittal's to the Commissioning Specialists. The Technical Commissioning Specialist must review the submittals to the extent necessary verify that the equipment and system installation will comply with the contract requirements and the requirements of the Basis of Design and the Owner's Project Requirements Document.

3.1.4 Inspection and Testing

Demonstrate that all system components have been installed, that each control device and item of equipment operates, and that the systems operate and perform, including interactive operation between systems, in accordance with contract documents and the Owner's Project Requirements. Requirements in related specification sections are independent from the requirements of this section and do not satisfy any of the requirements specified in this specification section. Provide all materials, services, and labor required to perform the Pre-Functional Checks and Functional Performance Tests.

3.1.4.1 Commissioning Team

Provide a commissioning representative for each sub-contractor associated with the systems to be commissioned. The commissioning representative is responsible for coordination of the commissioning activities for the systems to be commissioned with the respective sub-contractor. The coordination includes the planning and execution of required inspections and testing. The designers listed below are the designers of record for their respective systems. Substitutes must be approved by the Contracting Officer's Representative.

3.1.4.1.1 Mechanical System Pre-Functional Checks Team

The following team members must participate in Pre-Functional checks of mechanical systems:

Designation	Function
CxM	Mechanical System Technical Commissioning Specialist
QAR	Contracting Officer's Quality Assurance Representative
CQC	Contractor's Quality Control Personnel
MC	Contractor's Mechanical Commissioning Representative

Designation	Function
EC	Contractor's Electrical Commissioning Representative
CC	Contractor's Controls Commissioning Representative
TABC	Contractor's TAB Commissioning Representative

3.1.4.1.2 Mechanical Systems Test Team

The following team members must participate in Functional Performance of mechanical systems:

Designation	Function
CxM	Mechanical System Technical Commissioning Specialist
QAR	Contracting Officer's Quality Assurance Representative
CQC	Contractor's Quality Control Personnel
MC	Contractor's Mechanical Commissioning Representative
EC	Contractor's Electrical Commissioning Representative
CC	Contractor's Controls Commissioning Representative
TABC	Contractor's TAB Commissioning Representative

3.1.4.1.3 Other Pre-Functional and Functional Performance Participants

The following may participate as team members during Pre-Functional Checks and Functional Performance Testing:

Designation	Function
BCE	Base Civil Engineer Office Representative
User	Using Agent's Representative

3.1.4.2 Pre-Functional Checks

Pre-Functional Checklists from the approved Final Construction Phase Commissioning Plan must be completed by the commissioning team. Complete one Pre-Functional Checklist for each individual item of equipment or system for each system required to be commissioned including, but not limited to, ductwork, piping, equipment, fixtures (lighting and plumbing), and controls. Indicate commissioning team member inspection and acceptance of each Pre-Functional Checklist item by initials. Acceptance of each Pre-Functional Checklist item by each team member indicates that item conforms to the construction contract requirements in their area of responsibility. Technical Commissioning Specialist acceptance of each Pre-Functional Checklist item indicates that each item has been installed correctly and in accordance with contract documents and the Owner's Project Requirements. Submit the completed and initialed Pre-Functional Checklists no later than 7 calendar days after completion of inspection of all checklists items for each system. Submit one hard copy and an electronic copy. Include manufacturer start-up checklists associated with equipment with the submission of the Pre-Functional Checklists.

3.1.4.3 Testing, Adjusting, and Balancing (TAB) Report and Field Acceptance Testing

The Mechanical System Technical Commissioning Specialist must review the pre-final TAB Report required by Specification Section 23 05 93 TESTING, ADJUSTING, AND BALANCING FOR HVAC. Identify any deficiencies to the Contracting Officer's Representative and the Contractor's Quality Control Personnel. Resolve all deficiencies prior to TAB Field Acceptance Testing.

The Mechanical System Technical Commissioning Specialist must witness the TAB Field Acceptance Testing specified by Specification Section 23 05 93 TESTING, ADJUSTING, AND BALANCING FOR HVAC. Include a certification by the Mechanical Technical Specialist that no outstanding deficiencies exist in the systems relative to Testing, Adjusting, and Balancing with the final TAB Report submittal.

3.1.4.4 HVAC Controls Test Reports

The Mechanical System Technical Commissioning Specialist must review the Start-Up Testing Report and the PVT Procedures and Reports required by Specification Section 23 0900 INSTRUMENTATION AND CONTROL FOR HVAC. Include a certification by the Mechanical System Technical Commissioning Specialist that the submittals contain no deficiencies or that the submittals do not indicate any deficiencies in the HVAC systems or HVAC control systems with each of these submittals.

3.1.4.5 Tests

3.1.4.5.1 Functional Performance Tests

Schedule Functional Performance Tests for each system only after the Certificate of Readiness has been approved by the Government for the system. Correct all deficiencies identified

through any prior review, inspection, or test activity before the start of Functional Performance Tests.

a. Functional Performance Tests must be performed with the Contracting Officer's Quality Assurance Representative present.

b. Abort Functional Performance Tests when any system deficiency prevents the successful completion of the test.

c. Technical Commissioning Specialists must lead and document all Functional Performance Tests for the systems to be commissioned. The representatives listed in the paragraph Commissioning Team must attend the tests. Abort Functional Performance Tests when any required commissioning team member is not present for the test.

3.1.4.5.1.1 Checklist

Use the Functional Performance Test Checklists from the approved Final Construction Phase Commissioning Plan to guide the Functional Performance Tests. Functional Performance Tests must be performed for each item of equipment and each system required to be commissioned and verify all sensor calibrations, control responses, safeties, interlocks, operating modes, sequences of operation, capacities, lighting levels, and all other performance requirements comply with construction contract regardless of the specific items listed within the Functional Performance Test provided. Testing must progress from equipment or components to subsystems to systems to interlocks and connections between systems. The order of components and systems to be tested must be determined by the Technical Commissioning Specialists.

3.1.4.5.1.2 Acceptance

Indicate acceptance of each item of equipment and systems tested by signature of each commissioning team member for each Functional Performance Test. The Contractor's Quality Control Representative and the Technical Commissioning Specialists must indicate acceptance after the equipment and systems are free of deficiencies.

3.1.4.5.2 HVAC Test Methods

Perform Functional Performance Tests in accordance with the following:

3.1.4.5.2.1 Prior to Testing

Prior to testing operating modes, sequences of operation, interlocks, and safeties, complete control point-to-point observations, test sensor calibrations, and test actuator commands.

3.1.4.5.2.2 Simulating Conditions

Over-writing control input values through the controls system is not acceptable, unless approved by the Contracting Officer's Representative. Identify proposed exceptions in a protocol submitted to the Contracting Officer's Representative for approval. Before simulating conditions, overwriting values (if approved), or changing set-points, calibrate all sensors, transducers and devices. Below are several examples of exceptions that would be considered acceptable:

a. When varying static pressures inside ductwork can not be simulated within the duct, and where a sensor signals the controls system to initiate sequences at various duct static pressures, it is acceptable to simulate the various pressures with a Pneumatic Squeeze-Bulb Type Signaling Device with gauge temporarily attached to the sensing tube leading to the transmitter. It is not acceptable to reset the various set-points, nor to simulate an electric analog signal (unless approved as noted above).

b. Dirty filter pressure drops can be simulated using sheets of cardboard at filter face.

c. Freeze-stat safeties can be simulated by packing portion of sensor with ice.

d. High outside air temperatures can be simulated with a hair blower.

e. High entering cooling coil temperatures can be used to simulate entering cooling coil conditions.

f. Do not use signal generators to simulate sensor signals unless approved by the Contracting Officer's Representative, as noted above, for special cases.

g. Control set points can be altered. For example, to see the air conditioning compressor lockout work at an outside air temperature below 55 degrees F, when the outside air temperature is above 55 degrees F, temporarily change the lockout set point to be 0 degrees F above the current outside air temperature. Caution: Set points are not to be raised or lowered to a point such that damage to the components, systems, or the building structure and/or contents will occur.

h. Test duct mounted smoke detectors in accordance with the manufacturer's recommendations. Perform the tests with air system at minimum airflow condition in ductwork.

i. Test current sensing relays used for fan and pump status signals to control system to indicate unit failure and run status by resetting the set point on the relay to simulate a lost belt or unit failure while the unit is running. Confirm that the failure alarm was generated

and received at the control system. After the test is conducted, return the set point to its original set-point or a set-point as indicated by the Contracting Officer's Representative.

3.1.4.5.2.3 Setup

Perform each test under conditions that simulate actual conditions as close as is practically possible. Provide all necessary materials and system modifications to produce the necessary flows, pressures, temperatures, and other conditions necessary to execute the test according to the specified conditions. At completion of the test, return the affected building equipment and systems to their pre-test condition.

3.1.4.5.3 Sample Strategy

Perform Functional Performance Tests using the following sample strategy. Prepare and complete a Functional Performance Test Checklist for each and every piece of equipment installed on this job. Equipment Identifiers are as indicated on the design drawings:

Equipment Identifier	Sample Size (Percent)
OAU-1 AND HPCU-1	100%
FCU	100%
ACC	100%
CHWP	100%

3.1.4.5.4 Seasonal Tests

3.1.4.5.4.1 Initial Functional Performance Tests

Perform Initial Functional Performance Tests as soon as all contract work is completed, regardless of the season. Develop and implement means of artificial loading to demonstrate, to a reasonable level of confidence, the ability of the HVAC systems to handle peak seasonal loads.

3.1.4.5.4.2 System Acceptance

Systems may be partially accepted by the Government prior to seasonal testing if they comply with all construction contract that can be tested during initial Functional Performance Tests. All Functional Performance Test procedures must be completed prior to full systems acceptance.

3.1.4.5.5 Aborted Tests and Re-Testing

Abort Functional Performance Tests or Seasonal Tests if any deficiency prevents successful completion of the test or if any required commissioning team member is not present for the test. Reimburse the Government for all costs associated with effort lost due to re-testing due to test failures and aborted tests. These costs must include salary, travel costs, and per diem for Government commissioning team members. Re-test only after all deficiencies identified during the original tests have been corrected.

3.1.4.5.5.1 100 Percent Sample

Systems or equipment for which 100 percent sample size are tested fail if one or more of the test procedures results in discovery of a deficiency and the deficiency cannot be resolved within 5 minutes during the test.

Re-test to the extent necessary to confirm that the deficiencies have been corrected without negatively impacting the performance of the rest of the system.

3.1.4.5.5.2 Less than 100 Percent Sample

For systems tests with a sample size less than 100 percent, if one or more of the test procedures for an item of equipment or a system results in discovery of a deficiency, regardless of whether the deficiency is corrected during the sample tests, the item of equipment or system fails the test.

a. If the system failure rate is 5 percent or less, meaning that 5 percent or less of the equipment or systems had at least one deficiency, re-test only on the items which experienced the initial failures.

b. If the system failure rate is higher than 5 percent, meaning that more than 5 percent of equipment or systems tested had at least one deficiency, re-test the items which experienced the initial failures to the extent necessary to confirm that the deficiencies have been corrected . In addition, test another random sample of the same size as the initial sample for the first time. If the second random sample set has any failures, re-test those failed items and all remaining equipment and systems to complete 100 percent testing of that system type.

3.1.5 Training Plan

Develop a training plan which identifies all training required by specification sections associated with commissioned systems. Include a matrix listing each training requirement, content of the training, the trainer name, trainer contact information, and schedule and location

of training. Submit one hard copy and an electronic copy of the Training Plan to the Commissioning Specialists and the Government no later than 30 calendar days prior to the associated training.

Document training attendance using training attendance rosters and provide completed attendance rosters to the Commissioning Specialists and the Government no later than 7 calendar days following the completion of training for each system to be commissioned. Submit one hard copy and an electronic copy.

3.2 COMMISSIONING REPORT

Following the completion of Functional Performance Tests, with the exception of Seasonal Tests, the Lead Commissioning Specialist must prepare a Commissioning Report.

a. Include an executive summary describing the overall commissioning process, the results of the commissioning process, any outstanding deficiencies and recommended resolutions, and any seasonal testing that must be scheduled for a later date. Indicate, in the executive summary, whether the systems meet the requirements of the construction contract and the Owner's Project Requirements.

b. Detail any deficiencies discovered during the commissioning process and the corrective actions taken in the report. Include the completed Pre-Functional Checklists, Functional Performance Test Checkliststhe Commissioning Plans, the Issues Log, Performance Verification Test Reports, Training Attendance Rosters, the Design Review Report, the final TAB Report.

c. Submit the Commissioning Report no later than 14 calendar days following commissioning team acceptance of all Functional Performance Tests with the exception of Seasonal Tests. Submit three hard copies and an electronic copy.

d. Following any Seasonal Tests or Post-Construction Activities, update the Final Commissioning Report to reflect any changes and resubmit.

-- End of Section --

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SECTION 024100 - SELECTIVE DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Selective demolition of building elements for alteration purposes.

B. Abandonment and removal of existing utilities and utility structures.

1.02 RELATED REQUIREMENTS

A. Section 000102 - Project Information and Summary

B. Section 01 5000 - Temporary Facilities and Controls

C. Section 01 7000 - Execution and Closeout Requirements

D. Section 01 7419 - Construction Waste Management and Disposal

1.03 REFERENCE STANDARDS

A. 29 CFR 1926 - Safety and Health Regulations for Construction Current Edition.

B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations 2022, with Errata (2021).

1.04 SUBMITTALS

A. See Section 01 3001 - Submittals

B. Site Plan: Showing:

1. Vegetation to be protected.

2. Areas for temporary construction and field offices.

C. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.

1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences.

2. Identify demolition firm and submit qualifications.

3. Include a summary of safety procedures.

4. Demolition Plan shall include a detailed project schedule which incorporates the project phasing requirements and durations identified in Section 01 1000 -

Summary.

D. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION

3.01 SCOPE

A. Remove paving, concrete pads and curbs as required to accomplish new work.

B. Remove items as indicated on the drawings.

3.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.

1. Obtain required permits.

2. Comply with applicable requirements of NFPA 241.

3. Use of explosives is not permitted.

4. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.

5. Provide, erect, and maintain temporary barriers and security devices.

6. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.

7. Conduct operations to minimize effects on and interference with adjacent structures and occupants.

8. Do not close or obstruct roadways or sidewalks without permit.

9. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.

10. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.

B. Do not begin removal until receipt of notification to proceed from the Government.

C. Do not begin removal until built elements to be salvaged or relocated have been removed.

D. Protect existing structures and other elements that are not to be removed.

1. Provide bracing and shoring.

2. Prevent movement or settlement of adjacent structures.

3. Stop work immediately if adjacent structures appear to be in danger.

E. If hazardous materials are discovered during removal operations, stop work and notify Contracting Officer. Hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.

F. Perform demolition in a manner that maximizes salvage and recycling of materials.

1. Comply with requirements of Section 017419 - Waste Management.

2. Dismantle existing construction and separate materials.

3. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.

G. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.

3.03 EXISTING UTILITIES

A. Protect existing utilities to remain from damage.

B. Do not disrupt public utilities or utilities affecting the existing building or other buildings on base without permit from authority having jurisdiction.

C. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Contracting Officer.

D. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Contracting Officer

E. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using barricades if necessary.

1. Coordinate with the Government to apply for and receive required dig permits in advance of excavation work required by the project.

F. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

G. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone; identify and mark utilities to be subsequently reconnected, in same manner as other utilities to remain.

H. Do not disrupt utilities without written authorization from designated base personal. Coordinate required utility disruptions to limit impact on base personnel.

3.04 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.

1. Verify that construction and utility arrangements are as indicated.

2. Report discrepancies to Contracting Officer before disturbing existing installation.

3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.

C. Remove existing work as indicated and as required to accomplish new work.

1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.

2. Remove items indicated on drawings.

D. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove existing systems and equipment as indicated.

1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components.

2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.

3. Verify that abandoned services serve only abandoned facilities before removal.

4. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification.

E. Protect existing work to remain.

1. Prevent movement of structure; provide shoring and bracing if necessary.
2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
3. Repair adjacent construction and finishes damaged during removal work.
4. Patch as specified for patching new work.

3.05 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site daily.

B. Leave site in clean condition, ready for subsequent work.

C. Conceal all debris, junk, trash, and demolished materials inside the building or in closed lid exterior containers so as to prevent dust and debris from becoming air borne.

D. When required, or when directed by contracting officer, wet down all debris, junk, trash, and demolished materials immediately prior to removal of these materials from the project site as required to prevent dust and debris from becoming air borne during transfer of materials from storage containers to vehicle intended to remove the materials from the site.

END OF SECTION

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SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete formwork.

B. Floors and slabs on grade.

C. Concrete reinforcement.

D. Joint devices associated with concrete work.

E. Concrete curing.

F. Materials included in this section shall meet the requirements for High Performance Sustainable Buildings for New Construction points for the following Sections:

1. 2-6.1.1 - Recycled Content
2. 2-6.1.2 - Biologically Based Products
3. The contractor is expected to understand the HPSB requirements for these sections and include all applicable overhead in their base bid for the necessary documentation to achieve the above listed credits.

G. Section 32 1314 - Concrete Paving: Sidewalks, curbs and gutters.

1.02 REFERENCE STANDARDS

A. ACI 117 - Specification for Tolerances for Concrete Construction and Materials 2010 (Reapproved 2015).

B. ACI 211.1 - Selecting Proportions for Normal-Density and High Density-Concrete - Guide 2022.

C. ACI 301 - Specifications for Concrete Construction 2020.

D. ACI 302.1R - Guide to Concrete Floor and Slab Construction 2015.

E. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete 2000 (Reapproved 2009).

F. ACI 305R - Guide to Hot Weather Concreting 2020.

G. ACI 306R - Guide to Cold Weather Concreting 2016.

H. ACI 308R - Guide to External Curing of Concrete 2016.

I. ACI 318 - Building Code Requirements for Structural Concrete 2019 (Reapproved 2022).

J. ACI 347R - Guide to Formwork for Concrete 2014 (Reapproved 2021).

K. ASTM A185/A185M - Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete; 2007.

L. ASTM A497/A497M - Standard Specification for Steel Welded Wire Reinforcement, Deformed, for Concrete; 2007.

M. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement 2022.

N. ASTM C33/C33M - Standard Specification for Concrete Aggregates 2018.

O. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens 2021.

P. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete 2022a.

Q. ASTM C150/C150M - Standard Specification for Portland Cement 2022.

R. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete 2020.

S. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete 2010a (Reapproved 2016).

T. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete 2019.

U. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete 2019, with Editorial Revision (2022).

V. ASTM C618 - Standard Specification for Coal Ash and Raw or Calcined Natural Pozzolan for Use in Concrete 2023.

W. ASTM C881/C881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete 2020a.

X. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete 2016.

Y. ASTM C1059/C1059M - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete 2021.

Z. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink) 2020.

AA. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures 2020.

BB. ASTM D994/D994M - Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type) 2011 (Reapproved 2022).

CC. COE CRD-C 572 - Handbook for Concrete and Cement Corps of Engineers Specifications for Polyvinylchloride Waterstop 1974.

DD. NSF 61 - Drinking Water System Components - Health Effects 2022, with Errata.

1.03 SUBMITTALS

A. See Section 01 3001 - Submittals, for submittal procedures.

B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.

C. Samples for Pigment Color Selection: Submit manufacturer's complete sample chip set, including pigment number and required dosage rate for each color.

D. Verification Samples: Submit sample chips of specified colors indicating pigment numbers and required dosage rates, for subsequent comparison to installed concrete.

E. Samples: Submit samples of underslab vapor retarder to be used.

F. Test Reports: Submit report for each test or series of tests specified.

G. Manufacturer's Installation Instructions: For concrete accessories, indicate installation procedures and interface required with adjacent construction.

H. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

I. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated, based on comprehensive testing of current materials:

J. Material Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:

1. Retain list below with either paragraph above. Edit to suit Project.
2. Cementitious materials and aggregates.
3. Form materials and form-release agents.
4. Steel reinforcement and reinforcement accessories.
5. Admixtures.
6. Waterstops.
7. Curing materials.
8. Floor and slab treatments.
9. Bonding agents.
10. Adhesives.
11. Vapor retarders.
12. Epoxy joint filler.
13. Joint-filler strips.
14. Repair materials.

K. Formwork Shop Drawings: Design and engineering of formwork are Contractor's responsibility.

1. Delete subparagraph below if no shoring and reshoring are required.
2. Shoring and Reshoring: Indicate proposed schedule and sequence of stripping formwork, shoring removal, and installing and removing reshoring.

L. Steel Reinforcement Shop Drawings: Details of fabrication, bending, and placement, prepared according to ACI 315, "Details and Detailing of Concrete Reinforcement." Include material, grade, bar schedules, stirrup spacing, bent bar diagrams, arrangement, and supports of concrete reinforcement. Include special reinforcement required for openings through concrete structures.

M. Design Mixes: For each concrete mix. Include alternate mix designs when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.

1. Indicate amounts of mix water to be withheld for later addition at Project site.

N. Sustainability Submittals, Product data for HPSB Compliance:

1. For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content.

   a. Include statement indicating costs (sell price for each product having recycled content)

   b. Total weight of products provided

2. If any fly ash, ground granulated blast furnace slag, silica fume, rice hull ash, or other waste material is used in mix designs to replace Portland cement, submit the total volume of concrete cast in place, mix design(s) used showing the quantitiy of portland cement replaced, reports showing successful cylinder testing, and temperature on day of pour if cold weather mix is used.

1.04 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI 301 and ACI 318.

   1. Maintain one copy of each document on site.

B. Follow recommendations of ACI 305R when concreting during hot weather.

C. Follow recommendations of ACI 306R when concreting during cold weather.

D. Installer Qualifications: An experienced installer who has completed concrete Work similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

E. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.

F. Testing Agency Qualifications: An independent testing agency as provided by the Contractor, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548. Retesting if failed test to be provided and paid for by the General Contractor.

   1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

G. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, each aggregate from one source, and each admixture from the same manufacturer.

H. Welding: Qualify procedures and personnel according to AWS D1.4, "Structural Welding Code--Reinforcing Steel."

1.05 DELIVERY, STORAGE, AND HANDLING

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

1.06 SUSTAINABILITY REQUIREMENTS

A. Contractor shall endeavor to provide materials with a high recycled content.

1. A minimum post-consumer recycled content of 30% is required for reinforcing steel.

PART 2 PRODUCTS

2.01 FORMWORK

A. Formwork Design and Construction: Comply with guidelines of ACI 347R to provide formwork that will produce concrete complying with tolerances of ACI 117.

B. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.

1. Form Facing for Exposed Finish Concrete: Contractor's choice of materials that will provide smooth, stain-free final appearance including:

a. Plywood, metal, or other approved panel materials.

b. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:

1) Select one of four subparagraphs below or revise to suit Project. First imparts glossy finish, second imparts matte finish, and third and fourth impart coarser-textured finish depending on face-ply characteristics.

2) High-density overlay, Class 1, or better.

3) Medium-density overlay, Class 1, or better, mill-release agent treated and edge sealed.

4) Structural 1, B-B, or better, mill oiled and edge sealed.

5) B-B (Concrete Form), Class 1, or better, mill oiled and edge sealed.

2. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

3. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that will produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.

C. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch (19 by 19 mm), minimum.

D. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

2. Form-Release agent to contain a minimum Biobased content of 87% per the USDA's standards

E. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

1. Delete or revise subparagraphs below to suit Project.

2. Furnish units that will leave no corrodible metal closer than 1 inch (25 mm) to the plane of the exposed concrete surface.

3. Furnish ties that, when removed, will leave holes not larger than 1 inch (25 mm) in diameter in concrete surface.

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

2.02 REINFORCEMENT

A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi) (420 MPa).

1. Type: Deformed billet-steel bars.

2. Finish: Unfinished, unless otherwise indicated.

B. Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain type.

1. Form: Coiled Rolls.

2. Mesh Size and Wire Gage: As indicated on drawings.

C. Reinforcement Accessories:

1. Tie Wire: Annealed, minimum 16 gage, 0.0508 inch (1.29 mm).

2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.

a. Provide solid concrete bricks to support bottom mats of spread footings and bottom bars in grade beams where rebar support will be in direct contact with soil. Concrete brick sizes as required to provide specified concrete cover.

b. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected or CRSI Class 2 stainless-steel bar supports.

3. Joint Dowel Bars: Plain-steel bars, ASTM A 615, Grade 60. Cut bars true to length with ends square and free of burrs.

2.03 CONCRETE MATERIALS

A. Cement: ASTM C150/C150M, Type I - Normal Portland type.

B. Fine and Coarse Aggregates: ASTM C 33.

1. Nominal Maximum Aggregate Size: 3/4 inch (19 mm).

C. Fly Ash: ASTM C618, Class C or F.

D. Calcined Pozzolan: ASTM C618, Class N.

E. Silica Fume: ASTM C1240, proportioned in accordance with ACI 211.1.

F. Water: Clean and not detrimental to concrete.

2.04 ADMIXTURES

A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement. Do not use admixtures containing calcium chloride.

B. Air Entrainment Admixture: ASTM C260/C260M.

C. High Range Water Reducing Admixture: ASTM C494/C494M Type F.

D. Water Reducing and Accelerating Admixture: ASTM C494/C494M Type E.

E. Water Reducing and Retarding Admixture: ASTM C494/C494M Type D.

F. Water Reducing Admixture: ASTM C494/C494M Type A.

2.05 ACCESSORY MATERIALS

A. Underslab on Grade Vapor Retarder

1. Performance-Based Specification: Vapor retarder membrane shall be manufactured from virgin polyolefin resins, and when tested according to all requirements of ASTM E1745, shall meet the following minimum performance requirements: Install per manufacturer's recommendations. Tape all joints and waterproof seal all penetrations.

   a. Thickness: 15 mill

   b. 0.0063 Perm, Water Vapor Permeance in accordance with ASTM E-96

   c. Greater than 3200 Gram Puncture Resistance in accordance with ASTM D 1709 Method B

   d. 72.61 (12.61) Lb. Force/Inch (kN/m) Tensile Strength per ASTM E 154 Section 9e. 0.0052 Perm Water Vapor Permeance After Wetting Out Drying Out and After Long-Term Soaking per ASTM E-154 Section 8 and ASTM E-96 Procedure B

   e. 0.0057 Perm Water Vapor Permeance Resistance to Plastic Flow and Elevated Temperature per ASTM E-154 Section 11 and ASTM E-96 Procedure B

   f. 0.0052 Perm Water Vapor Permeance Effect Low Temperature and Flexibility ASTM E-154, Section 12 ASTM E-96, Procedure B

   g. 0.0052 Perm Water Vapor Permeance Resistance to Deterioration From Organisms and Substances in Contacting Soil ASTM E-154, Section 13 ASTM E-96 Procedure B

   h. i. 8.7 x 10-9 Radon Transmittance (m/s) k124/02/95

   i. 3.3 x 10-12 Radon Coefficient (m^2/s)

B. Non-Shrink Cementitious Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.

1. Minimum Compressive Strength at 28 Days: 7,000 pounds per square inch (48 MPa).

2.06 BONDING AND JOINTING PRODUCTS

A. Latex Bonding Agent: Non-redispersable acrylic latex, complying with ASTM C1059/C1059M, Type II.

B. Epoxy Bonding System:

1. Two-component epoxy resin, capable of humid curing and bonding to damp surfaces.

2. Class and grade to suit requirements, and as follows:

a. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

C. Waterstops: Rubber, complying with COE CRD-C 513.

1. Factory fabricate corners, intersections, and directional changes.

2. Profile: Flat, dumbbell with center bulb.

D. Reglets: Formed steel sheet, galvanized, with temporary filler to prevent concrete intrusion during placement.

1. Fabricate reglets of not less than 0.0217-inch- (0.55-mm-) thick galvanized steel sheet.

E. Slab Isolation Joint Filler: 1/2 inch (13 mm) thick, height equal to slab thickness, with removable top section that will form 1/2 inch (13 mm) deep sealant pocket after removal.

F. Joint Filler: Nonextruding, resilient asphalt impregnated fiberboard, felt, or cork, complying with ASTM D 1751, 1/4 inch thick (6 mm thick) and 4 inches deep (200 mm deep); tongue and groove profile.

G. Dovetail Anchor Slots: Hot-dip galvanized steel sheet, not less than 0.0336 inch (0.85 mm) thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.

H. Epoxy Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Shore A hardness of 80 per ASTM D 2240.

I. Sealant and Primer: As specified in Section 079005.

2.07 CURING MATERIALS

A. Moisture-Retaining Sheet: ASTM C171.

1. Polyethylene film, clear, minimum nominal thickness of 0.0040 inch (0.10 mm).

2. White-burlap-polyethylene sheet, weighing not less than 10 ounces per linear yard, 40 inches wide (305 g/sq m).

B. Evaporation Retarder:

1. Waterborne, monomolecular film forming retarder manufactured for application to fresh concrete.

2. Provide product meeting the recommendations of the following American Institute Publications:

a. ACI 302 Guide for Concrete Floor and Slab Construction

b. ACI 308 Guide to Curing Concrete

c. ACI 305 Recommended Practices for Hot Weather Concreting

d. ACI 345 Guide for Concrete highway Bridge and Deck Construction.

C. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) dry.

D. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.

E. Water: Potable, not detrimental to concrete.

2.08 CONCRETE MIX DESIGN

A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.

1. Replace as much Portland cement as possible with fly ash, ground granulated blast furnace slag, silica fume, or rice hull ash as is consistent with ACI recommendations.

B. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301.

1. For trial mixtures method, employ qualified, independent testing agency acceptable to the Government for preparing and reporting proposed mix designs.

C. Slab-on-Grade: Proportion normal-weight concrete mix as follows:

1. Compressive Strength (28 Days): 3000 psi (20.7 MPa).

2. Maximum Slump: 4 inches (100 mm).

D. Cementitious Materials: For concrete exposed to deicers, limit percentage, by weight, of cementitious materials other than portland cement according to ACI 301 requirements.

E. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:

1. Fly Ash: 20 percent.

F. Maximum Water-Cementitious Materials Ratio: 0.53 for concrete with a 28 day compressive strength of F'c = 3000 psi.

G. Maximum Water-Cementitious Materials Ratio: 0.45 for concrete with a 28 day compressive strength of F'c = 4000 psi.

H. Limit water - soluble, chloride-ion content in hardened concreter to 0.15 percent by weight of cement.

I. Air Content: Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content of 4 to 6 percent, unless otherwise indicated.

J. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended or required by manufacturer.

1. Use water-reducing admixture or high-range water-reducing admixture (superplasticizer) in concrete, as required, for placement and workability.

2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

2.09 REPAIR MATERIALS

A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch (3.2 mm) and that can be feathered at edges to match adjacent floor elevations.

1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.

2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.

3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3 to 6 mm) or coarse sand as recommended by underlayment manufacturer.

4. Compressive Strength: Not less than 4100 psi (29 MPa) at 28 days when tested according to ASTM C 109/C 109M.

2.10 MIXING

A. Transit Mixers: Comply with ASTM C94/C94M.

B. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94, and furnish batch ticket information.

1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify lines, levels, and dimensions before proceeding with work of this section.

3.02 PREPARATION

A. Formwork: Comply with requirements of ACI 301. Design and fabricate forms to support all applied loads until concrete is cured, and for easy removal without damage to concrete.

B. Verify that forms are clean and free of rust before applying release agent.

C. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.

1. Use epoxy bonding system for bonding to damp surfaces, for structural load-bearing applications, and where curing under humid conditions is required.

2. Use latex bonding agent only for non-load-bearing applications.

D. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.

E. Ensure vapor barrier is installed in accordance with project specifications prior to placing concrete.

3.03 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until concrete structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:

1. Select surface classes, usually two or more, from subparagraphs below. Indicate where each class applies. Classes are taken from ACI 347R. See Evaluations.

2. Class A, 1/8 inch (3 mm).

D. Construct forms tight enough to prevent loss of concrete mortar.

E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical. Kerf wood inserts for forming keyways, reglets, recesses, and the like, for easy removal.

1. Do not use rust-stained steel form-facing material.

F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

H. Chamfer exterior corners and edges of permanently exposed concrete.

I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.04 REMOVING AND REUSING FORMS

A. General: Formwork, for sides of beams, walls, columns, and similar parts of the Work, that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete provided concrete is hard enough to not be damaged by form-removal operations and provided curing and protection operations are maintained.

B. Leave formwork, for beam soffits, joists, slabs, and other structural elements, that supports weight of concrete in place until concrete has achieved the following:

1. At least 75 percent of 28-day design compressive strength.

C. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

D. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched or damaged forms for concrete surfaces unless approved by the Government.

3.05 EMBEDDED ITEMS

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

1. Install anchor bolts, accurately located, to elevations required.

2. Select applicable subparagraphs below and add others if required. Revise to suit Project.

3. Install reglets to receive top edge of foundation sheet waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

4. Install dovetail anchor slots in concrete structures as indicated and required.

3.06 INSTALLING REINFORCEMENT AND OTHER EMBEDDED ITEMS

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

1. Do not cut or puncture vapor barrier. Repair damage and reseal vaporbarrier before placing concrete. Refer to division 07.

B. Comply with requirements of ACI 301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.

C. Install welded wire reinforcement in maximum possible lengths on bar supports spaced to minimize sagging and offset end laps in both directions. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

D. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with concrete placement.

1. Shop- or field-weld reinforcement according to AWS D1.4, where indicated.

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

3.07 VAPOR RETARDERS

A. Vapor Retarder: Refer to paragraph 2.05 of this section.

B. Granular Fill: Cover compacted subgrade with granular fill, moisten, and compact with mechanical equipment to elevation tolerances of plus 0 inch (0 mm) or minus 3/4 inch (19 mm).

3.08 PLACING CONCRETE

A. Place concrete in accordance with ACI 304R.

B. Place concrete for floor slabs in accordance with ACI 302.1R.

C. Notify the Government not less than 48 hours prior to commencement of placement operations.

D. Ensure reinforcement, inserts, waterstops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.

E. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

3.09 SLAB JOINTING

A. Locate joints as indicated on drawings.

B. Anchor joint fillers and devices to prevent movement during concrete placement.

C. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab.

D. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

E. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of strip placements of slabs on grade.

2. Form from preformed, plastic keyway-section forms, or bulkhead forms with keys, unless otherwise indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.

3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.

4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.

5. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

6. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

F. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness, as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch (3 mm). Repeat grooving of

contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.

G. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.

2. Terminate full-width joint-filler strips not less than 1/2 inch (12 mm) or more than 1 inch (25 mm) below finished concrete surface where joint sealants, specified in Division 7 Section "Joint Sealants," are indicated.

3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

H. Dowel Joints: Install dowel sleeves and dowels or dowel bar and support assemblies at joints where indicated.

1. Use dowel sleeves or lubricate or asphalt-coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.10 FLOOR FLATNESS AND LEVELNESS TOLERANCES

A. Maximum Variation of Surface Flatness:

1. Exposed Concrete Floors: 1/4 inch (6 mm) in 10 feet (3 m).

2. Under Seamless Resilient Flooring: 1/4 inch (6 mm) in 10 feet (3 m).

3. Under Carpeting: 1/4 inch (6 mm) in 10 feet (3 m).

B. Correct the slab surface if tolerances are less than specified.

C. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

3.11 WATERSTOPS

A. Flexible Waterstops: Install in construction joints as indicated to form a continuous diaphragm. Install in longest lengths practicable. Support and protect exposed waterstops during progress of Work. Field-fabricate joints in waterstops according to manufacturer's written instructions.

3.12 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Do not add water to concrete during delivery, at Project site, or during placement, unless approved by Architect.

C. Deposit concrete continuously or in layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete to avoid segregation.

D. Deposit concrete in forms in horizontal layers no deeper than 24 inches (600 mm) and in a manner to avoid inclined construction joints. Place each layer while preceding layer is still plastic, to avoid cold joints.

   1. Consolidate placed concrete with mechanical vibrating equipment. Use equipment and procedures for consolidating concrete recommended by ACI 309R.

   2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations no farther than the visible effectiveness of the vibrator. Place vibrators to rapidly penetrate placed layer and at least 6 inches (150 mm) into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mix constituents to segregate.

E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

   1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.

   2. Maintain reinforcement in position on chairs during concrete placement.

   3. Screed slab surfaces with a straightedge and strike off to correct elevations.

   4. Slope surfaces uniformly to drains where required.

   5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, free of humps or hollows, before excess moisture or bleedwater appears on the surface. Do not further disturb slab surfaces before

starting finishing operations.

F. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When air temperature has fallen to or is expected to fall below 40 deg F (4.4 deg C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F (10 deg C) and not more than 80 deg F (27 deg C) at point of placement.

2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators, unless otherwise specified and approved in mix designs.

G. Hot-Weather Placement: Place concrete according to recommendations in ACI 305R and as follows, when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.

2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.

3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.13 CONCRETE FINISHING

A. Finishing Formed Surfaces

1. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defective areas repaired and patched. Remove fins and other projections exceeding ACI 347R limits for class of surface specified.

a. Apply to concrete surfaces of retaining walls to be covered with earth backfill.

2. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Remove fins and other

projections exceeding 1/8 inch (3 mm) in height.

a. Apply to concrete surfaces exposed to public view or to be covered with a coating or covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, or painting.

b. Do not apply rubbed finish to smooth-formed finish.

3. Rubbed Finish: Apply the following to smooth-formed finished concrete:

a. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.

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

B. Finishing Floors and Slabs

1. General: Comply with recommendations in ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

2. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.

a. Apply float finish to surfaces indicated, to surfaces to receive trowel finish, and to floor and slab surfaces to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo.

3. Trowel Finish: After applying float finish, apply first trowel finish and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

a. Apply a trowel finish to surfaces indicated and to floor and slab surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or

quarry tile set over a cleavage membrane, paint, or another thin film-finish coating system

b. Finish surfaces to the following tolerances, measured within 24 hours according to ASTM E 1155/E 1155M for a randomly trafficked floor surface:

1) Specified overall values of flatness, F(F) 35; and levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and levelness, F(L) 17; for slabs-on-grade.

2) For slab on grade areas receiving thin set tile, the overall minimum values of flatness shall be, F(F) 50 and the levelness, F(L) 35. Local values of flatness shall be, F(F) 35, and levelness, F(L) 20.

4. Trowel and Fine-Broom Finish: Apply a partial trowel finish, stopping after second troweling, to surfaces indicated and to surfaces where ceramic or quarry tile is to be installed by either thickset or thin-set method. Immediately after second troweling, and when concrete is still plastic, slightly scarify surface with a fine broom.

3.14 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete Work.

B. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates of manufacturer furnishing machines and equipment.

3.15 CURING AND PROTECTION

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and with recommendations in ACI 305R for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing by one or a combination of the following methods:

D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces, by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

   a. Water.

   b. Continuous water-fog spray.

   c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

   a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.16 LIQUID FLOOR TREATMENTS

A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment according to manufacturer's written instructions.

1. Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants and complete surface repairs.

2. Do not apply to concrete that is less than seven days old.

3. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing. Rinse with water; remove excess material until surface is dry. Apply a second coat in a similar manner if surface is rough or porous.

3.17 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.

1. Defer joint filling until concrete has aged at least six months. Do not fill joints until construction traffic has permanently ceased.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

3.18 FIELD QUALITY CONTROL

A. Testing Agency: Contractor will engage a qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement. Sampling and testing for quality control may include those specified in this Article.

B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements: All retesting as a result of failed test to be provided by and paid for by the General Contractor.

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mix exceeding 5 cu. yd. (4 cu. m), but less than 25 cu. yd. (19 cu. m), plus one set for each additional 50 cu. yd. (38 cu. m) or fraction thereof.

2. Slump: ASTM C 143; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mix. Perform additional tests when concrete consistency appears to change.

3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.

4. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when 80 deg F (27 deg C) and above, and one test for each composite sample.

5. Compression Test Specimens: ASTM C 31; cast and laboratory cure one set of four standard cylinder specimens for each composite sample.

6. Compressive-Strength Tests: ASTM C 39; test one laboratory-cured specimens at 7 days and two at 28 days. Hold fourth specimen for future specimen for future testing if required. Discard if not required.

    a. The contractor shall engage a qualified independent testing laboratory to make, field cure, and test standard cylinder specimens. The results of these tests shall be used by the contractor to evaluate field curing and for form removal.

    b. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at age indicated.

C. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.

D. Strength of each concrete mix will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3.4 MPa).

E. Test results shall be reported in writing to the Government, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7-and 28-day tests.

F. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.

G. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by the Government. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42 or by other methods as directed by Architect.

3.19 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by the Government. Remove and replace concrete that cannot be repaired and patched to the

Government approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 (1.2-mm) sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch (13 mm) in any dimension in solid concrete but not less than 1 inch (25 mm) in depth. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.

2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.

3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by the Government.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch (0.25 mm) wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.

2. After concrete has cured at least 14 days, correct high areas by grinding.

3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.

4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according

to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.

5. Repair defective areas, except random cracks and single holes 1 inch (25 mm) or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least 3/4 inch (19 mm) clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mix as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

6. Repair random cracks and single holes 1 inch (25 mm) or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to the Government's approval, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to the Government's approval.

END OF SECTION

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SECTION 033680 - CONCRETE POLISHING AND DYING

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including requirements of the Government's Solicitation and Division 1 Specification Sections, apply to this Section.

B. Section 01 3325 - Project Sustainability Summary

C. Section 01 3329 - Sustainable Design Reporting

D. Section 01 6000 - Product Requirements

E. Section 01 7419 - Construction Waste Management and Disposal

1.02 SUMMARY

A. This Section includes polished concrete finish for interior concrete floors denoted on Finish Schedule as PDC (Polished Dyed Concrete). Polished concrete finished for pre-cast concrete, vertical cast-in-place concrete, and exterior concrete are specified in the sections for those types of concrete.

B. Furnish all labor, material, equipment and services necessary for the dry diamond grinding and polishing of concrete floors.

C. Applying densifying impregnator/sealer and polishing to specified sheen level and aggregate exposure.

D. Concrete must be cured a minimum of 28 days prior to polishing.

E. Installation of PDC indicates acceptance of the concrete substrate.

1.03 REFERENCES

A. American Concrete Institute (ACI):

B. American Society for Testing and Materials:

1. ASTM C779, Standard Test Method for Abrasion of Horizontal Concrete Surfaces

2. ASTM C805, Impact Strength

3. ASTMG23-81, Ultraviolet Light and Water Spray

4. ASTM 1028, Co-Efficient of Friction

5. ASTM C 150, Type I, II Portland cement conformity, depending on soil conditions

6. ASTM C 33, Aggregate conformity

1.04 SUBMITTALS

A. Submit the following in accordance with Submittal Procedures in Division 1 Sections.

B. Product data for concrete densifying impregnator, penetrating sealer, concrete dyes, joint filler and any other chemicals used in the process.

C. Applicators qualification data.

D. Polished concrete samples: size 6”x6” for each Polished Concrete finish required.

E. Maintenance procedures for Polished Concrete using diamond impregnated cleaning pads.

F. Sustainability Submittals, Product data for HPSB Compliance:

1. For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content

   a. Include statement indicating costs (sell price for each product having recycled content)

   b. Total weight of products provided

2. For products containing VOCs, documentation (material safety data sheets (MSDS), third-party certificates, or test reports) showing printed statement of VOC content.

   a. VOC Content Limitations: For the specified products, submit documentation of conformance with Specification Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions. For products using electricity, documentation showing printed statement that device meets FEMP designated efficiency requirements or Energy Star qualified

1.05 QUALITY ASSURANCE

A. Basis of design: Polished Concrete

B. Certified Contractors:

1. Pre-qualified contractors meeting ALL requirements set forth within specifications.

2. Substitutions will be allowed or approved only per contract document requirements and Section 01 6000 Product Requirements.

C. Pre-Pour Installation Conference: Conduct conference at project site to comply with requirements in Division 1 Sections “Special Conditions” and “Administrative Requirements”.

D. Provide project names, addresses, contact names, phone numbers, of at least three (3) projects of similar scope and size completed by the installer.

E. Manufacturer’s Certification: Provide letter of certification stating that the installer is a certified applicator and is familiar with proper procedures and installation requirements recommended by the manufacturer.

F. Mock-ups:

1. Mock-ups to be approximately 100 square feet per color and finish in location indicated or if not indicated, as directed by the the Government.

2. Install mock-ups to verify selections made under sample submittal and to demonstrate methods and workmanship proposed for the project.

3. Control joints should be included in mock-up. Sawing performed by General Contractor can begin as soon as the surface is firm enough not to displace any of the aggregate.

4. Edges should be included in mock-up.

G. Protection: General Contractor shall protect areas to receive polished concrete finish at all times during construction to prevent oils, dirt, metal, excessive water and other potentially damaging materials from affecting the finished concrete surface. Protection measures listed below shall begin immediately after the concrete slab is poured:

1. All hydraulic powered equipment shall be diapered to avoid staining of the concrete.

2. All vehicle parking shall be prohibited on the finish slab area. If necessary to complete their scope of work, drop clothes shall be placed under vehicles at all times.

3. No pipe cutting machine shall be used on the finish floor slab.

4. Steel shall not be placed on the finish slab to avoid rusting.

5. Acids and acidic detergents will not come in contact with slab.

6. All painters will use drop cloths on the concrete. If paint gets on the concrete, it must be removed immediately.

7. All trades will be informed that the slab must be protected at all times.

H. Environmental Limitations

1. Comply with manufacturers written instructions for substrate temperature and moisture content, ambient temperature and humidity, ventilation and other conditions affecting chemical performance.

2. Application of finish system shall take place a minimum of 21 days prior to fixture and trim installation and/or Beneficial Occupancy.

3. Finished concrete area shall be closed to traffic during finish floor application and after application, for the time as recommended by manufacturer.

PART 2 – PRODUCTS

2.01 POLISHING MATERIALS

A. Three-phase 480 Volt generator

B. Three (3) head or four (4) head counter rotating, variable speed, electric floor grinding/polishing machines with at least 600 pounds down pressure.

C. Dust extraction system, pre-separator, and squeegee attachments with minimum flow rating of 322 cubic feet per minute.

D. Grinding Tools

1. Metal bonded diamonds 16, 25, 40, 80, and 150 grits

2. Resin bonded diamonds 100, 200, 400, 800 and 1500 grits

E. Grinding Pads for Edges

1. 30, 60 and 120 grits

2. 100, 200, 400 and 800 grits

F. Hand Grinder with dust extraction attachment and pads.

G. Densifier: A concrete hardener chemically reactive, waterborne solution of inorganic silicate or siliconate materials and proprietary components; odorless; colorless which hardens and densifies concrete surfaces to protect against abrasion, dusting, and

absorption of liquids.

1. Provide a product with the following characteristics:

    a. Specific Gravity: 1.10

    b. pH 11.0

    c. Weight per Gallon of 9.2 lbs

    d. 14.5% active content

    e. 14.5% total solid content

    f. 0 g/L VOC Content

H. Control Joint and Sawcut Filler, two part polyurea.

1. Provide a product with the following characteristics:

    a. Shore D Hardness of 34 to 36 per ASTM D2240

    b. Shore A Hardness of 84 to 88 per ASTM D2240

    c. Tensile Strength @ 7 Days of 660 psi (4.6 MPa) per ASTM D412

    d. Elongation @ 7 Days of 220% to 260% per ASTM D412

    e. Chemical Resistance as follows:

        1) ASTM D1308, Good Rating for Brake Fluid, Ethylene Glycol, and Sulfuric Acid (10%).

        2) ASTM D1308, Excellent Rating for Acetic Acid (5%), Alcohol (10%), Alkalies, Ammonium Hydroxide (10%), Diesel Fuel, Gasoline, Hydrochloric Acid (20%), JP-4 Jet Fuel, Used Motor Oil, Salt Water, Sodium Hydroxide (10%)

I. Dye: A penetrating dye that chemically combines with cured concrete to produce permanent, variegated or translucent color effects. Available in water-based or solvent-based formulas.

1. Color as indicated on the drawings

J. Stain Guard: Protect from debris and contaminants.

1. Provide a product with the following characteristics:

a. Specific Gravity: 1.08

b. pH 11.0

c. Weight per Gallon of 8.99 lbs

d. 22% active content

e. 22% total solid content per ASTM D2369

f. less than 100 g/L VOC Content

K. Diamond Impregnated Cleaning Pads

PART 3 – EXECUTION

3.01 PREPARATION

A. Installer shall examine and approve concrete substrate for conditions affecting performance of finish. General Contractor shall correct conditions that are found to be out of compliance with the requirements of this section. Repairs are not acceptable unless specifically approved on a case-by-case basis by the Government.

B. Verify that base slab meets finish and surface profile requirements listed in Division 3, Section “Cast in Place Concrete”.

C. Provide floor clean of materials and debris.

D. Protect adjacent surfaces as required to prevent damage by the concrete polishing procedure.

E. Set up grinding machine, dust extraction system, tooling and generator.

F. Ensure floor cured to accept polishing application.

3.02 POLISHED CONCRETE APPLICATION

A. Applicator shall examine the areas and conditions under which work of this section will be provided and the General Contractor shall correct conditions detrimental to the timely and proper completion of the work and the Applicator shall not proceed until unsatisfactory conditions are resolved.

B. Fill construction joints and cracks with filler products as specified in accordance with manufacturers instructions colored to match (or contrast) with concrete color as specified by the Government. All control joint and decorative saw cut filling must be performed prior to grinding application.

C. Grind the concrete floor to within 2-3 inches of walls with 16, 25, 40 and 80 grit removing construction debris, floor slab imperfections and until there is a uniform scratch pattern and desired concrete aggregate exposure is achieved. Vacuum the floor thoroughly using a squeegee vacuum attachment. Utilize the least aggressive diamond tooling necessary to remove all debris and to achieve uniform scratch pattern.

D. Grind the edges with 30, 60, and 120 grit grinding pads, prior to grinding the floor with each step on the larger diamond grinder, removing all of the scratches from the previous grit. Vacuum the floor thoroughly after each grind using a squeegee vacuum attachment.

E. Grind the floor to within 2-3 inches of walls with metal bonded diamond grits of 150 and/or 300, grinding 90 degrees from each previous grind and removing all the scratches from the previous grit. Vacuum the floor thoroughly after each grind using a squeegee vacuum attachment.

F. Polish the floor with resin bonded diamond grits of 100, 200, 400, first polishing the edges (if specified) with pads of the same grit and then the field of the floor, removing all scratches from the previous grit. After each polish, clean the floor thoroughly using a vacuum with a squeegee attachment. After the 400 grit polishing step thoroughly clean the floor with a mop or auto-scrubber to prepare for dye (if specified).

G. (If specified) Apply dye color per manufacturer's recommendations. Apply two (2) coats of dye to achieve desired coloration.

H. Apply densifying impregnator undiluted as per manufacturer's specifications and guidelines. Cover the entire work area liberally and allow to sit for ten (10) minutes. Apply again to areas where the densifying impregnator has soaked in and allow to sit for an additional thirty (30) minutes. Squeegee excess material off the floor.

I. Polish the floor with resin bonded diamond grit of 800, first polishing the edges (if specified) with pads of the same grit and then the field of the floor, removing all scratches from the previous grit. After polishing, clean the floor thoroughly using clean water and an auto scrubber or a mop and a wet vacuum.

J. Apply stain guard with a micro-fiber applicator and burnish with a fine 800 grit, or very fine 1500 grit diamond impregnated cleaning pad.

K. Upon completion, the work shall be ready for final inspection and acceptance by the customer.

PART 4 – SCHEDULES

4.01 SHEEN

A. Polished Concrete Level 2 1500 grit (Medium Gloss Finish):

1. At a distance of 30 to 50 feet the floor will reveal moderate reflection.

    a. Yield a 40 to 60 degree sheen, as measured by a Horiba IG-310

END OF SECTION

SECTION 042000 - UNIT MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete block.

B. Clay Facing Brick.

C. Mortar and Grout.

D. Reinforcement and Anchorage.

E. Flashings.

F. Lintels.

G. Accessories.

H. Materials included in this section shall meet the requirements for High Performance Sustainable Buildings for New Construction points for the following Sections:

1. 2-6.1.1 - Recycled Content.

2. The contractor is expected to understand the HPSB requirements for these sections and include all applicable overhead in their base bid for the necessary documentation to achieve the above listed credits.

1.02 RELATED REQUIREMENTS

A. Section 055000 - Metal Fabrications: Loose steel lintels.

B. Section 072100 - Thermal Insulation: Insulation for cavity spaces.

C. Section 07 8401 - Firestopping: Firestopping at penetrations of fire-rated masonry and at top of fire-rated walls.

D. Section 079200 - Joint Sealants: Sealing control and expansion joints.

E. Section 07 6500 - Wall Flashing

1.03 REFERENCE STANDARDS

A. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures 2022.

B. ACI 530.1/ASCE 6/TMS 602 - Specification For Masonry Structures; American Concrete Institute International; 2008.

C. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2016a.

D. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement 2022.

E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2022.

F. ASTM C62 - Standard Specification for Building Brick (Solid Masonry Units Made From Clay or Shale) 2017.

G. ASTM C67 - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile 2017.

H. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units 2022.

I. ASTM C91/C91M - Standard Specification for Masonry Cement 2023.

J. ASTM C129 - Standard Specification for Nonloadbearing Concrete Masonry Units 2022.

K. ASTM C140/C140M - Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units 2022c.

L. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar 2018.

M. ASTM C150/C150M - Standard Specification for Portland Cement 2022.

N. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes 2018.

O. ASTM C216 - Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale) 2022.

P. ASTM C270 - Standard Specification for Mortar for Unit Masonry 2019a, with Editorial Revision.

Q. ASTM C404 - Standard Specification for Aggregates for Masonry Grout 2018.

R. ASTM C476 - Standard Specification for Grout for Masonry 2023.

S. ASTM C744 - Standard Specification for Prefaced Concrete and Calcium Silicate Masonry Units 2021.

T. ASTM C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry 2020.

U. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete 2016.

V. BIA Technical Notes No. 13 - Ceramic Glazed Brick Exterior Walls 2017.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all relevant installers.

1.05 SUBMITTALS

A. See Section 01 3001 - Submittals, for submittal procedures.

B. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and masonry accessories.

C. Samples: Submit four samples of decorative block units to illustrate color, texture, and extremes of color range.

D. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.

E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

1. See Section 016000 - Product Requirements, for additional provisions.

F. Sustainability Submittals, Product data for HPSB Documentation:

1. For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content.

a. Include statement indicating costs (sell price for each product having recycled content)

b. Total weight of products provided

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

1.07 SUSTAINABILITY REQUIREMENTS

A. Contractor shall endeavor to provide materials with a high recycled content

PART 2 PRODUCTS

2.01 CONCRETE MASONRY UNITS

A. Concrete Block: Comply with referenced standards and as follows:

1. Size: Standard units with nominal face dimensions of 16 by 8 inches (400 by 200 mm) and nominal depths as indicated on drawings for specific locations.

2. Special Shapes: Provide non-standard blocks configured for corners.

   a. Provide bullnose units for outside corners. Base course to be square units.

3. Load-Bearing Units: ASTM C90, normal weight.

   a. Hollow block, as indicated.

   b. Exposed Faces: Manufacturer's standard color and texture.

4. Non-Loadbearing Units: ASTM C129.

   a. Hollow block.

2.02 BRICK UNITS

A. Limited brick veneer masonry work is required as a part of this project. Where required at new openings, Contractor shall salvage and re-use existing brick and/or find new brick of matching color, size, and shape. Submit samples of new face brick for approval prior to ordering.

2.03 MORTAR AND GROUT MATERIALS

A. Masonry Cement: ASTM C91/C91M, Type N.

1. Colored Mortar: Premixed cement as required to match approved sample.

2. Substitutions: See Section 016000 - Product Requirements.

B. Portland Cement: ASTM C150/C150M, Type I; color as required to produce approved color sample.

C. Hydrated Lime: ASTM C207, Type S.

D. Mortar Aggregate: ASTM C144.

E. Grout Aggregate: ASTM C404.

F. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C979/C979M.

1. Color(s): Color to be selected by the Government from manufacturer's full range of colors as required to match the existing mortar installed in adjacent areas of brick scheduled to remain and receive cleaning and tuck pointing.

G. Water: Clean and potable.

2.04 REINFORCEMENT AND ANCHORAGE

A. Manufacturers:

1. Reputable manufacturer engaged in the manufacturing of masonry reinforcing and anchorage systems for a minimum of 10 years.

B. Reinforcing Steel: ASTM A615/A615M Grade 60 (420) deformed billet bars; galvanized.

C. Horizontal Joint Reinforcement:

1. Use ladder type joint reinforcement where vertical reinforcement is involved and truss type elsewhere, unless otherwise indicated.

2. Provide pre-formed Angle and T reinforcing at corners and intersections.

D. Strap Anchors: Bent steel shapes configured as required for specific situations, 1-1/4 in (32 mm) width, 0.105 in (2.7 mm) thick, lengths as required to provide not more than 1 inch (25 mm) and not less than 1/2 inch (13 mm) of mortar coverage from masonry face, corrugated for embedment in masonry joint, hot dip galvanized to ASTM A 153/A 153M Class B.

E. Single Wythe Joint Reinforcement: ASTM A951/A951M.

1. Type: Truss or ladder. 16 inches on center vertically.

2. Material: ASTM A1064/A1064M steel wire, mill galvanized to ASTM A641/A641M, Class 3.

3. Size: 0.1875 inch (4.8 mm) side rods with 0.1875 inch (4.8mm) cross rods; width as required to provide not less than 5/8 inch (16 mm) of mortar coverage on each exposure.

F. Flexible Anchors: 2-piece anchors that permit differential movement between masonry and building frame, sized to provide not more than 1 inch (25 mm) and not less than 1/2 inch (13 mm) of mortar coverage from masonry face.

1. Concrete frame: Dovetail anchors of bent steel strap, nominal 1 inch (25 mm) width x 0.024 in (0.61 mm) thick, with trapezoidal wire ties 0.1875 inch (4.75 mm) thick, hot dip galvanized to ASTM A 153/A 153M, Class B.

2. Steel frame: Crimped wire anchors for welding to frame, 0.25 inch (6.3 mm) thick, with trapezoidal wire ties 0.1875 inch (4.75 mm) thick, hot dip galvanized to ASTM A 153/A 153M, Class B.

G. Masonry Veneer Anchors: 2-piece anchors that permit differential movement between masonry veneer and structural backup, hot dip galvanized to ASTM A 153/A 153M, Class B.

1. Anchor plates: Not less than 0.075 inch (1.91 mm) thick, designed for fastening to structural backup through sheathing by two fasteners; provide design with legs that penetrate sheathing and insulation to provide positive anchorage.

2. Wire ties: Manufacturer's standard shape, 0.1875 inch (4.75 mm) thick.

3. Vertical adjustment: Not less than 3 inches (76 mm).

2.05 FLASHINGS

A. Thru Wall Flashing - Refer to Division 07.

B. Sheet Metal Flashing - Refer to Division 07.

2.06 ACCESSORIES

A. Preformed Control Joints: Rubber material. Provide with corner and tee accessories, fused joints. Field locate as required prior to installation. Control Joint spacing shall not exceed maximum spacing as indicated on structural drawings.

B. Joint Filler: Closed cell polyvinyl chloride; oversized 50 percent to joint width; self expanding; maximum lengths available.

C. Weeps:

1. Honeycomb design

2. Polypropylene material tested in accordance with ASTM D2240, D790B, D638, and D1238B

3. Size: 3/8" thickness x height and depth necessary to fill entire joint of masonry construction of which it is installed. Provide custom sizes if necessary.

D. Mortar Net: Fluid conducting non-absorbent Polyester mesh 16" x 96" x 3/4". Use multiple layers at bottom of wall and above through wall flashing when air space depth exceeds masonry mat thickness by 3/8'.

E. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials, as recommended by brick and mortar manufacturer.

F. Where horizontal reinforcement is specified, provide prefabricated "L" and "T" sections. Cut and bend reinforcing units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

G. Stainless Steel Termination Bar install continuous termination bar - refer to Section 07 6500.

2.07 MORTAR AND GROUT MIXES

A. Mortar for Unit Masonry: ASTM C270, using the Proportion Specification.

1. Masonry below grade and in contact with earth: Type S.

2. Exterior, loadbearing masonry: Type S.

3. Exterior, non-loadbearing masonry: Type S.

4. Interior, loadbearing masonry: Type S.

B. Colored Mortar: Proportion selected pigments and other ingredients to match Architect's sample, without exceeding manufacturer's recommended pigment-to-cement ratio.

C. Grout: ASTM C476; consistency required to fill completely volumes indicated for grouting; fine grout for spaces with smallest horizontal dimension of 2 inches (50 mm) or less; coarse grout for spaces with smallest horizontal dimension greater than 2 inches (50 mm).

D. Mixing: Use mechanical batch mixer and comply with referenced standards.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive masonry.

B. Verify that related items provided under other sections are properly sized and located.

C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.02 PREPARATION

A. Direct and coordinate placement of metal anchors supplied for installation under other sections.

B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.03 COLD AND HOT WEATHER REQUIREMENTS

A. Maintain materials and surrounding air temperature to minimum 40 degrees F (5 degrees C) prior to, during, and 48 hours after completion of masonry work.

B. Maintain materials and surrounding air temperature to maximum 90 degrees F (32 degrees C) prior to, during, and 48 hours after completion of masonry work.

3.04 COURSING

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Concrete Masonry Units:

1. Bond: Running.

2. Coursing: One unit and one mortar joint to equal 8 inches (200 mm).

3. Mortar Joints: Concave.

D. Brick Units:

1. Bond: Running.

2. Coursing: Three units and three mortar joints to equal 8 inches (200 mm).

3. Mortar Joints: Concave.

3.05 PLACING AND BONDING

A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.

B. Lay hollow masonry units with face shell bedding on head and bed joints.

C. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.

D. Remove excess mortar and mortar smears as work progresses.

E. Interlock intersections and external corners, except for units laid in stack bond.

F. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

G. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

H. Cut mortar joints flush where wall tile is scheduled or resilient base is scheduled.

I. Isolate masonry partitions from vertical structural framing members with a control joint as indicated.

J. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler.

3.06 WEEPS/CAVITY VENTS

A. Install weeps in veneer and cavity walls at 24 inches (600 mm) on center horizontally above through-wall flashing, above shelf angles and lintels, and at bottom of walls.

B. Provide top of wall weeps at 24” on center horizontally, above through-wall flashing, above shelf angles, lintels, and at bottom of walls. Locate as indicated on the drawings and at the top of all masonry veneer air space cavities as directed by the Government. Locate at consistent elevations within 8” of the top of the masonry cavities.

   1. Install tube weeps in lieu of polypropylene weeps where top of wall conditions occurs in cast stone. Locate tube weep at bottom edge of stone unit and locate weep at all head joints.

C. Install cavity vents in veneer and cavity walls at 32 inches (800 mm) on center horizontally below shelf angles and lintels and near top of walls.

3.07 CAVITY MORTAR CONTROL

A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep/cavity vents.

B. For cavity walls, build inner wythe ahead of outer wythe to accommodate accessories.

C. Install cavity mortar control panels continuously throughout full height of exterior masonry cavities during construction of exterior wythe, complying with manufacturer's installation instructions. Verify that airspace width is no more than 3/8 inch (9 mm) greater than panel thickness. Install horizontally between joint reinforcement. Stagger end joints in adjacent rows. Fit to perimeter construction and penetrations without voids.

D. Install cavity mortar diverter at base of cavity and at other flashing locations as recommended by manufacturer to prevent mortar droppings from blocking weep/cavity vents.

3.08 REINFORCEMENT AND ANCHORAGE - GENERAL

A. Unless otherwise indicated on drawings or specified under specific wall type, install horizontal joint reinforcement 16 inches (400 mm) on center.

B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches (400 mm) each side of opening.

C. Lap joint reinforcement ends minimum 6 inches (150 mm).

D. Fasten anchors to structural framing and embed in masonry joints as masonry is laid. Unless otherwise indicated on drawings or closer spacing is indicated under specific wall type, space anchors at maximum of 36 inches (900 mm) horizontally and 24 inches (600 mm) vertically.

E. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.

3.09 REINFORCEMENT AND ANCHORAGE - SINGLE WYTHE MASONRY

A. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches (400 mm) each side of opening.

B. Lap joint reinforcement ends minimum 6 inches (150 mm).

3.10 REINFORCEMENT AND ANCHORAGES - CAVITY WALL MASONRY

A. Install horizontal joint reinforcement 16 inches (400 mm) on center.

B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches (400 mm) each side of openings.

C. Lap joint reinforcement ends minimum 6 inches (150 mm).

D. Fasten anchors to structural framing and embed in masonry joints as masonry is laid. Space anchors at maximum of 16 inches (400 mm mm) horizontally and 16 inches (400 mm) vertically.

3.11 MASONRY FLASHINGS

A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.

B. Refer to Division 7 for flashing requirements.

3.12 LINTELS

A. Install loose steel lintels over openings of size required for loading if not specified otherwise.

B. Install reinforced unit masonry lintels over openings where steel or precast concrete lintels are not scheduled.

3.13 GROUTED COMPONENTS

A. Reinforce bond beams with 2 scheduled bars, 1 inch (25 mm) from bottom web.

B. Lap splices minimum 24 bar diameters.

C. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch (13 mm) of dimensioned position.

D. Place and consolidate grout fill without displacing reinforcing.

E. At bearing locations, fill masonry cores with grout for a minimum 12 inches (300 mm) either side of opening.

3.14 CONTROL AND EXPANSION JOINTS

A. Do not continue horizontal joint reinforcement through control or expansion joints.

B. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.

3.15 BUILT-IN WORK

A. As work progresses, install built-in metal door frames and other items to be built into the work and furnished under other sections.

B. Install built-in items plumb, level, and true to line.

C. Bed anchors of metal door and glazed frames in adjacent mortar joints. Fill frame voids solid with grout.

1. Fill adjacent masonry cores with grout minimum 12 inches (300 mm) from framed openings.

D. Do not build into masonry construction organic materials that are subject to deterioration.

3.16 TOLERANCES

A. Maximum Variation from Alignment of Columns: 1/4 inch (6 mm).

B. Maximum Variation From Unit to Adjacent Unit: 1/16 inch (1.6 mm).

C. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft (6 mm/3 m) and 1/2 inch in 20 ft (13 mm/6 m) or more.

D. Maximum Variation from Plumb: 1/4 inch (6 mm) per story non-cumulative; 1/2 inch (13 mm) in two stories or more.

E. Maximum Variation from Level Coursing: 1/8 inch in 3 ft (3 mm/m) and 1/4 inch in 10 ft (6 mm/3 m); 1/2 inch in 30 ft (13 mm/9 m).

F. Maximum Variation of Mortar Joint Thickness: Head joint, minus 1/4 inch, plus 3/8 inch (minus 6.4 mm, plus 9.5 mm).

G. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch (6 mm).

3.17 CUTTING AND FITTING

A. Cut and fit for chases. Coordinate with other sections of work to provide correct size, shape, and location.

B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.18 FIELD QUALITY CONTROL

A. The Contractor shall employ an independent testing agency to complete the following tests. Refer to section 01 4000 - Quality Requirements for additional requirements.

1. Clay Masonry Unit Tests: Test each variety of clay masonry in accordance with ASTM C67 requirements, sampling 5 randomly chosen units for each 50,000 installed.

2. Concrete Masonry Unit Tests: Test each variety of concrete unit masonry in accordance with ASTM C140/C140M for conformance to requirements of this specification.

3. Mortar Tests: Test each type of mortar in accordance with ASTM C780, testing with same frequency as masonry samples.

3.19 CLEANING

A. Remove excess mortar and mortar droppings.

B. Replace defective mortar. Match adjacent work.

C. Clean soiled surfaces with cleaning solution.

D. Use non-metallic tools in cleaning operations.

3.20 PROTECTION

A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION

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SECTION 051200 - STRUCTURAL STEEL FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Structural steel framing members.

B. Base plates, shear stud connectors and expansion joint plates.

C. Grouting under base plates.

D. Materials included in this section shall meet the requirements for High Performance Sustainable Buildings for New Construction points for the following Sections:

1. 2-6.1.1 - Recycled Content

1.02 RELATED REQUIREMENTS

A. Section 052100 - Steel Joist Framing.

B. Section 053100 - Steel Decking: Support framing for small openings in deck.

C. Section 055000 - Metal Fabrications: Steel fabrications affecting structural steel work.

1.03 REFERENCE STANDARDS

A. AISC (MAN) - Steel Construction Manual 2017.

B. AISC S303 - Code of Standard Practice for Steel Buildings and Bridges 2016.

C. AISC S348 - Specification for Structural Joints Using ASTM A325 or A490 Bolts; 2004.

D. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.

E. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished 2018.

F. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2016a.

G. ASTM A242/A242M - Standard Specification for High-Strength Low-Alloy Structural Steel 2013 (Reapproved 2018).

H. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength 2021.

I. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength 2014.

J. ASTM A325M - Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength (Metric) 2014.

K. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes 2021a.

L. ASTM A992/A992M - Standard Specification for Structural Steel Shapes 2022.

M. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable 2021a.

N. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength 2018a.

O. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink) 2020.

P. ASTM F436 - Standard Specification for Hardened Steel Washers 2011.

Q. ASTM F959 - Standard Specification for Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners 2013.

R. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength 2020.

S. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination 2020.

T. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020, with Errata (2022).

1.04 SUBMITTALS

A. See Section 01 3001 - Submittals, for submittal procedures

B. Shop Drawings:

1. Indicate profiles, sizes, spacing, locations of structural members, openings, attachments, and fasteners.

2. Indicate cambers and loads.

3. Indicate welded connections with AWS A2.4 welding symbols. Indicate net weld lengths.

C. Manufacturer's Mill Certificate: Certify that products meet or exceed specified requirements.

D. Sustainability Submittals, Product data for HPSB Documentation:

1. For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content.

a. Include statement indicating costs (sell price for each product having recycled content).

b. Total weight of products provided.

1.05 QUALITY ASSURANCE

A. Fabricate structural steel members in accordance with AISC (MAN) "Steel Construction Manual."

B. Maintain one copy of each document on site.

C. Fabricator: Company specializing in performing the work of this section with minimum 5 years of documented experience.

D. Erector: Company specializing in performing the work of this section with minimum 5 years of documented experience.

E. Design of connections not detailed on the drawings shall be the responsibility of the fabricator. Proposed connections shall be submitted to the engineer of record in the the State in which the Project is located for review.

1.06 SUSTAINABILITY REQUIREMENTS

A. Contractor shall endeavor to provide materials with a high recycled content.

1. A minimum post-consumer recycled content of 30% is required.

PART 2 PRODUCTS

2.01 MATERIALS

A. Steel Angles and Plates: ASTM A36/A36M.

B. Steel W Shapes and Tees: ASTM A992/A992M.

C. Rolled Steel Structural Shapes: ASTM A992/A992M.

D. Steel Shapes, Plates, and Bars: ASTM A242/A242M high-strength, corrosion-resistant structural steel.

E. Cold-Formed Structural Tubing: ASTM A500/A500M, Grade B.

F. Steel Sheet: ASTM A1011/A1011M, Designation SS, Grade 30 hot-rolled, or ASTM A1008/A1008M, Designation SS, Grade 30 cold-rolled.

G. Shear Stud Connectors: Made from ASTM A108 Grade 1015 bars.

H. High-Strength Structural Bolts, Nuts, and Washers: ASTM A325 or ASTM A325M, Type 1, medium carbon, galvanized, with matching compatible ASTM A563 or ASTM A563M nuts and ASTM F436 washers.

I. Headed Anchor Rods: ASTM F 1554 Grade 36, plain.

J. Load Indicator Washers: Provide washers complying with ASTM F959 at connections requiring high-strength bolts.

K. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

L. Grout: Non-shrink, non-metallic aggregate type, complying with ASTM C 1107/C 1107M and capable of developing a minimum compressive strength of 7,000 psi (48 MPa) at 28 days.

M. Shop and Touch-Up Primer: Fabricator's standard, complying with VOC limitations of authorities having jurisdiction.

N. Touch-Up Primer for Galvanized Surfaces: Fabricator's standard, complying with VOC limitations of authorities having jurisdiction.

O. Provide and coordinate structural steel steel requirements by elevator manufacturer. Provide additional steel supports where not shown on drawings as required for installation of fully functioning elevator.

2.02 FABRICATION

A. Shop fabricate to greatest extent possible.

B. Continuously seal joined members by continuous welds. Grind exposed welds smooth.

C. Fabricate connections for bolt, nut, and washer connectors.

D. Develop required camber for members.

2.03 FINISH

A. Shop prime structural steel members. Do not prime surfaces that will be fireproofed, field welded, in contact with concrete, or high strength bolted.

2.04 SOURCE QUALITY CONTROL

A. Provide shop testing and analysis of structural steel.

B. High-Strength Bolts: Provide testing and verification of shop-bolted connections in accordance with RCSC (HSBOLT) "Specification for Structural Joints Using High-Strength Bolts".

C. Welded Connection: Visually inspect all shop-welded connections. Perform ultrasonic or radiographic test on all full penetration (CJP) and groove welds.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that conditions are appropriate for erection of structural steel and that the work may properly proceed.

3.02 ERECTION

A. Erect structural steel in compliance with AISC S303 "Code of Standard Practice for Steel Buildings and Bridges".

B. Allow for erection loads, and provide sufficient temporary bracing to maintain structure in safe condition, plumb, and in true alignment until completion of erection and installation of permanent bracing.

C. Do not field cut or alter structural members without approval of the Government.

D. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.

E. Grout solidly between column plates and bearing surfaces, complying with manufacturer's instructions for nonshrink grout. Trowel grouted surfaces smooth, splaying neatly to 45 degrees.

3.03 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch (6 mm) per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch (6 mm).

3.04 FIELD QUALITY CONTROL

A. The Contractor shall employ an independent testing agency to complete the following tests. Refer to section 01 4000 - Quality Requirements for additional requirements.

1. High-Strength Bolts: Provide testing and verification of field-bolted connections in accordance with AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts", testing at least 20 percent of bolts at each connection. Visually inspect all bolts for snug tight condition.

END OF SECTION

SECTION 052100 - STEEL JOIST FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Open web steel joists and shear stud connectors, with bridging, attached seats and anchors.

B. Supplementary framing for floor and roof openings greater than 18 inches (450 mm).

C. Materials included in this section shall meet the requirements for High Performance Sustainable Buildings for New Construction points for the following Sections:

1. 2-6.1.1 - Recycled Content

2. The contractor is expected to understand the HPSB requirements for these sections and include all applicable overhead in their base bid for the necessary documentation to achieve the above listed credits.

1.02 RELATED REQUIREMENTS

A. Section 01 3325 - Project Sustainability Summary

B. Section 01 3329 - Sustainable Design Reporting

C. Section 01 6000 - Product Requirements

D. Section 01 7419 - Construction Waste Management and Disposal

E. Section 051200 - Structural Steel Framing: Superstructure framing.

F. Section 053100 - Steel Decking: Support framing for openings less than 18 inches (450 mm) in decking.

G. Section 055000 - Metal Fabrications: Non-framing steel fabrications attached to joists.

1.03 REFERENCE STANDARDS

A. AISC S348 - Specification for Structural Joints Using ASTM A325 or A490 Bolts; 2004.

B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.

C. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2016a.

D. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength 2021.

E. ASTM E165/E165M - Standard Practice for Liquid Penetrant Testing for General Industry 2018.

F. ASTM E709 - Standard Guide for Magnetic Particle Testing 2021.

G. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification 2021.

H. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020, with Errata (2022).

I. RCSC (HSBOLT) - Specification for Structural Joints Using High-Strength Bolts; Research Council on Structural Connections 2020.

J. SJI (SPEC) - Catalog of Standard Specifications Load Tables and Weight Tables for Steel Joists and Joist Girders 2011.

K. SJI Technical Digest No. 9 - Handling and Erection of Steel Joists and Joist Girders 2008.

L. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer 2004.

M. SSPC-Paint 25 - Zinc Oxide, Alkyd, Linseed Oil Primer for Use Over Hand Cleaned Steel, Type I and Type II; Society for Protective Coatings; 1997 (Ed. 2004).

N. SSPC-SP 2 - Hand Tool Cleaning 2018.

1.04 SUBMITTALS

A. See Section 01 3001 - Submittals, for submittal procedures.

B. Shop Drawings: Indicate standard designations, joist coding, configurations, sizes, spacings, cambers, locations of joists, joist leg extensions, bridging, connections, and attachments.

C. Welders' Certificates: Submit manufacturer's certificates, certifying welders employed on the Work, verifying AWS qualification within the previous 12 months.

1.05 QUALITY ASSURANCE

A. Perform Work, including that for headers and other supplementary framing, in accordance with SJI (SPEC) Standard Specifications Load Tables and SJI Technical Digest No. 9.

1. Maintain one copy of document on site.

B. Erector Qualifications: Company specializing in performing the work of this section with minimum 5 years documented experience.

C. Sustainability Submittals, Product data for HPSB Compliance:

1. For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content.

a. Include statement indicating costs (sell price for each product having recycled content)

b. Include total weight of products provided

1.06 DELIVERY, STORAGE, AND HANDLING

A. Transport, handle, store, and protect products to SJI requirements.

1.07 SUSTAINABILITY REQUIREMENTS

A. Contractor shall endeavor to provide materials with a high recycled content.

1. A minimum post-consumer recycled content of 30% is required.

PART 2 PRODUCTS

2.01 MATERIALS

A. Open Web Joists: SJI Type K Joists:

1. Provide bottom chord extensions as indicated.

2. End bearing of 4 inches (100 mm) on masonry supports, unless shown otherwise.

3. Finish: Shop primed.

B. Structural Steel For Supplementary Framing and Joist Leg Extensions: ASTM A 36/A 36M.

C. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

D. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.02 FABRICATION

A. Frame special sized openings in joist web framing, if indicated.

2.03 FINISH

A. Shop prime joists as specified.

B. Prepare surfaces to be finished in accordance with SSPC-SP 2.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions prior to beginning work.

3.02 ERECTION

A. Erect joists with correct bearing on supports.

B. Allow for erection loads. Provide sufficient temporary bracing to maintain framing safe, plumb, and in true alignment.

C. After joist alignment and installation of framing, field weld joist seats to steel bearing surfaces.

D. Install supplementary framing for floor and roof openings greater than 8 inches (<> mm), unless shown otherwise on drawings.

E. Do not permit erection of decking until joists are braced, bridged, and secured or until completion of erection and installation of permanent bridging and bracing.

F. Do not field cut or alter structural members without approval of joist manufacturer.

G. After erection, prime welds, damaged shop primer, damaged galvanizing, and surfaces not shop primed , except surfaces specified not to be primed.

3.03 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch (6 mm).

B. Maximum Offset From True Alignment: 1/4 inch (6 mm).

3.04 FIELD QUALITY CONTROL

A. The Contractor shall employ an independent testing agency to complete the following tests. Refer to section 01 4000 - Quality Requirements for additional requirements.

1. High-Strength Bolts: Provide testing and verification of field-bolted connections in accordance with RCSC (HSBOLT) "Specification for Structural Joints Using High-Strength Bolts", testing at least 20 percent of bolts at each connection.

2. Welded Connections: Visually inspect all field-welded connections and test at least 20 percent of welds using one of the following:

    a. Radiographic testing performed in accordance with ASTM E94.

    b. Ultrasonic testing performed in accordance with ASTM E164.

    c. Liquid penetrant inspection performed in accordance with ASTM E165/E165M.

    d. Magnetic particle inspection performed in accordance with ASTM E709.

END OF SECTION

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SECTION 053100 - STEEL DECKING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Floor deck.

B. Supplementary framing for openings up to and including 18 inches (450 mm).

C. Bearing plates and angles.

D. Materials included in this section shall meet the requirements for High Performance Sustainable Buildings for New Construction points for the following Sections:

1. 2-6.1.1 Recycled Content.

2. The contractor is expected to understand the HPSB requirements for these sections and include all applicable overhead in their base bid for the necessary documentation to achieve the above listed credits.

1.02 RELATED REQUIREMENTS

A. Section 01 3325 - Project Sustainability Summary

B. Section 01 3329 - Sustainable Design Reporting

C. Section 01 6000 - Product Requirements

D. Section 01 7419 - Construction Waste Management and Disposal

E. Section 033000 - Cast-in-Place Concrete: Concrete topping over metal deck.

F. Section 04 2000 - Unit Masonry Assemblies: Placement of anchors for bearing plates embedded in unit masonry assemblies.

G. Section 051200 - Structural Steel Framing: Support framing for openings larger than 18 inches (450 mm) and shear stud connectors.

H. Section 052100 - Steel Joist Framing: Support framing for openings larger than 18 inches (450 mm) and shear stud connectors.

I. Section 055000 - Metal Fabrications: Steel angle concrete stops at deck edges.

1.03 REFERENCE STANDARDS

A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.

B. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished 2018.

C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.

D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2022.

E. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable 2021a.

F. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020, with Errata (2022).

G. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel 2018, with Errata (2022).

H. SDI (DM) - Publication No.30, Design Manual for Composite Decks, Form Decks, and Roof Decks 2007.

I. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer 2004.

J. SSPC-Paint 25 - Zinc Oxide, Alkyd, Linseed Oil Primer for Use Over Hand Cleaned Steel, Type I and Type II; Society for Protective Coatings; 1997 (Ed. 2004).

K. UL (FRD) - Fire Resistance Directory Current Edition.

1.04 SUBMITTALS

A. See Section 01 3001 - Submittals for submittal procedures.

B. Shop Drawings: Indicate deck plan, support locations, projections, openings, reinforcement, pertinent details, and accessories.

C. Product Data: Provide deck profile characteristics, dimensions, structural properties, and finishes.

D. Certificates: Certify that products furnished meet or exceed specified requirements.

E. Submit manufacturer's installation instructions.

F. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.

G. Sustainability Submittals, Product data for HPSB Compliance:

1. For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content.

    a. Include statement indicating costs (sell price for each product having recycled content)

    b. Include total weight of products provided

1.05 QUALITY ASSURANCE

A. Design deck layout, spans, fastening, and joints in accordance with manufacturers written recommendations in and for the the State in which the Project is located for project conditions.

B. Installer Qualifications: Company specializing in performing the work of this Section with minimum 5 years of experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Cut plastic wrap to encourage ventilation.

B. Separate sheets and store deck on dry wood sleepers; slope for positive drainage.

1.07 SUSTAINABILITY REQUIREMENTS

A. Contractor shall endeavor to provide materials with a high recycled content.

1. A minimum post-consumer recycled content of 30% is required.

PART 2 PRODUCTS

2.01 STEEL DECK

A. All Deck Types: Select and design metal deck in accordance with SDI Design Manual.

1. Calculate to structural working stress design and structural properties specified.

2. Maximum Vertical Deflection of Floor Deck: 1/360 of span.

3. Maximum Vertical Deflection of Roof Deck: 1/240 of span.

4. Maximum Vertical Deflection of Form Deck: 1/360 of span.

B. Floor Deck: Fluted steel sheet :

1. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS) Grade 33/230, with G90/Z275 galvanized coating.

2. Structural properties as noted on the drawings.

2.02 ACCESSORY MATERIALS

A. Bearing Plates and Angles: ASTM A36/A36M steelunfinished.

B. Stud Shear Connectors: Made from ASTM A 108 Grade 1015 bars.

C. Welding Materials: AWS D1.1/D1.1M.

D. Fasteners: Galvanized hardened steel, self tapping.

E. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

F. Flute Closures: Closed cell foam rubber, 1 inch (25 mm) thick; profiled to fit tight to the deck.

2.03 FABRICATED DECK ACCESSORIES

A. Sheet Metal Deck Accessories: Metal closure strips, wet concrete stops, and cover plates, 22 gage (0.8 mm) thick sheet steel for roof and 20 gage for floor; of profile and size as indicated; finished same as deck.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions prior to beginning work.

3.02 INSTALLATION

A. Erect metal deck in accordance with SDI Design Manual and manufacturer's instructions. Align and level.

B. On concrete and masonry surfaces provide minimum 4 inch (100 mm) bearing.

C. On steel supports provide minimum 2 inch bearing.

D. Fasten deck to steel support members at ends and intermediate supports at 12 inches (300 mm) on center maximum, parallel with the deck flute and at each transverse flute using methods specified.

1. Welding: Use fusion welds through weld washers.

2. Place and secure special deep fluted sections for integral concrete bridging.

E. Clinch lock seam side laps, where applicable..

F. At mechanically fastened male/female side laps fasten at 24 inches (600 mm) on center maximum.

G. At welded male/female side laps weld at 18 inches (450 mm) on center maximum.

H. Weld deck in accordance with AWS D1.3/D1.3M.

I. At deck openings from 6 inches (150 mm) to 10 inches (254 mm) in size, provide 2 x 2 x 1/4 inch (50 x 50 x 6 mm) steel angle reinforcement. Place angles perpendicular to flutes; extend minimum two flutes beyond each side of opening and fusion weld to deck at each flute.

   1. See structural drawings for openings larger than 10 inches.

J. Where deck (other than cellular deck electrical raceway) changes direction, install 6 inch (150 mm) minimum wide sheet steel cover plates, of same thickness as deck. Fusion weld 12 inches (300 mm) on center maximum.

K. At floor edges, install concrete stops upturned to top surface of slab, to contain wet concrete. Provide stops of sufficient strength to remain stationary without distortion.

L. At openings between deck and walls, columns, and openings, provide sheet steel closures and angle flashings to close openings.

M. Close openings above walls and partitions perpendicular to deck flutes with single row of foam cell closures.

N. Weld stud shear connectors through steel deck to structural members below.

O. Immediately after welding deck and other metal components in position, coat welds, burned areas, and damaged surface coating, with touch-up primer.

END OF SECTION

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SECTION 055000 - METAL FABRICATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Shop fabricated steel items.

B. Materials included in this section shall meet the requirements for High Performance Sustainable Buildings for New Construction points for the following Sections:

1. 2-6.1.1 - Recycled Content.

2. The contractor is expected to understand the HPSB requirements for these sections and include all applicable overhead in their base bid for the necessary documentation to achieve the above listed credits.

1.02 RELATED REQUIREMENTS

A. Section 033000 - Cast-in-Place Concrete: Placement of metal fabrications in concrete.

B. Section 042000 - Unit Masonry: Placement of metal fabrications in masonry.

C. Section 055213 - Pipe and Tube Railings.

D. Section 099113 - Exterior Painting: Paint finish.

1.03 REFERENCE STANDARDS

A. ANSI A14.3 - American National Standard for Ladders -- Fixed -- Safety Requirements 2008 (Reaffirmed 2018).

B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.

C. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless 2022.

D. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.

E. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2016a.

F. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates 2018.

G. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength 2021.

H. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength 2014.

I. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes 2021a.

J. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing 2021.

K. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2022.

L. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength 2018a.

M. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination 2020.

N. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020, with Errata (2022).

O. SSPC-SP 2 - Hand Tool Cleaning 2018.

1.04 SUBMITTALS

A. See Section 01 3001 - Submittals, for submittal procedures.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.

1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

C. Welders' Certificates: Submit certification for welders employed on the project, verifying AWS qualification within the previous 12 months.

D. Sustainability Submittals, Product data for HPSB Compliance:

1. For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content.

a. Include statement indicating costs (sell price for each product having recycled content)

b. Total weight of products provided

1.05 QUALITY ASSURANCE

A. Fabricator Qualifications: A firm experienced in producing metal fabrications similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

B. Welding: Qualify procedures and personnel according to the following:

1. AWS D1.1, "Structural Welding Code--Steel."

1.06 PROJECT CONDITIONS

A. Field Measurements: Where metal fabrications are indicated to fit walls and other construction, verify dimensions by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

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 construction to ensure that actual dimensions correspond to established dimensions. Allow for trimming and fitting.

1.07 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.

1.08 SUSTAINABILITY REQUIREMENTS

A. Contractor shall endeavor to provide materials with a high recycled content.

1. A minimum post-consumer recycled content of 30% is required.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL

A. Steel Sections: ASTM A 36/A 36M.

B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.

C. Plates: ASTM A283/A283M.

D. Pipe: ASTM A 53/A 53M Grade B Schedule 40, black finish.

E. Slotted Channel Framing: ASTM A653/A653M, Grade 33.

F. Slotted Channel Fittings: ASTM A1011/A1011M.

G. Fasteners:

1. General: Provide Type 304 or 316 stainless-steel fasteners for exterior use and for both interior and exterior use where fastening into fire-retardant treated wood. Provide Zinc-plated fasteners with coating complying with ASTM B633, Class Fe/Zn 5, where built into exterior walls. Select fasteners for type, grade, class, and substrate required.

2. 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.

3. Anchor Bolts: ASTM F 1554, Grade 36.

4. Machine Screws: ASME B18.6.3 (ASME B18.6.7M).

5. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).

6. Plain Washers: Round, carbon steel, ASME B18.22.1 (ASME B18.22M).

7. Lock Washers: Helical, spring type, carbon steel, ASME B18.21.1 (ASME B18.21.2M).

8. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and equal to four times the load imposed when installed in concrete, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.

   a. Material: Carbon-steel components zinc-plated to comply with ASTM B 633, Class Fe/Zn 5.

   b. Material: Alloy Group 1 or 2 stainless-steel bolts complying with ASTM F 593 (ASTM F 738M) and nuts complying with ASTM F 594 (ASTM F 836M).

9. Toggle Bolts: FS FF-B-588, tumble-wing type, class and style as needed.

H. Cast-in-Place Anchors in Concrete: Anchors of type indicated below, fabricated from corrosion-resistant materials capable of sustaining, without failure, the load imposed within a safety factor of 4, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.

1. Threaded or wedge type; galvanized ferrous castings, either ASTM A 47 (ASTM 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.

I. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

2.02 FABRICATION

A. Fit and shop assemble items in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and secured.

C. Continuously seal joined members by continuous welds.

D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.03 FABRICATED ITEMS

A. Ladders: Steel; in compliance with ANSI A14.3; with mounting brackets and attachments; prime paint finish.

1. Side Rails: 1/2-inch x 3 inches (12 x 76mm) members spaced at 24 inches (609 mm).

2. Rungs: One inch (25 mm) diameter solid round bar spaced 12 inches (300 mm) on center.

3. Space rungs 7 inches (175 mm) from wall surface.

4. Refer to drawings for additional requirements.

B. Ledge Angles, Shelf Angles, Channels, and Plates Not Attached to Structural Framing: For Support of metal decking; prime paint finish.

1. Refer to specification 09 9672 Fluid Applied Insulative Coatings for additional instruction.

C. Lintels: As detailed; galvanized finish.

D. Door Frames for Overhead Door Openings and Wall Openings: Channel sections; prime paint finish.

2.04 GROUT

A. Nonshrink, Metallic Grout: Factory-packaged, ferrous-aggregate grout complying with ASTM C 1107, specifically recommended by manufacturer for heavy-duty loading applications.

B. 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.

2.05 FINISHES - STEEL

A. Prime paint steel items.

B. Prepare surfaces to be primed in accordance with SSPC-SP2.

C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

D. Prime Painting: One coat.

E. Galvanizing of Structural Steel Members: Galvanize after fabrication to ASTM A123/A123M requirements.

F. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements.

2.06 FABRICATION TOLERANCES

A. Squareness: 1/8 inch (3 mm) maximum difference in diagonal measurements.

B. Maximum Offset Between Faces: 1/16 inch (1.5 mm).

C. Maximum Misalignment of Adjacent Members: 1/16 inch (1.5 mm).

D. Maximum Bow: 1/8 inch (3 mm) in 48 inches (1.2 m).

E. Maximum Deviation From Plane: 1/16 inch (1.5 mm) in 48 inches (1.2 m).

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

3.03 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Perform field welding in accordance with AWS D1.1/D1.1M.

D. Obtain approval prior to site cutting or making adjustments not scheduled.

E. After erection, prime welds, abrasionsand surfaces not shop primed or galvanized , except surfaces to be in contact with concrete.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch (6 mm) per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch (6 mm).

C. Maximum Out-of-Position: 1/4 inch (6 mm).

END OF SECTION

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SECTION 055213 - PIPE AND TUBE RAILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Balcony railings and guardrails.

B. Materials included in this section shall meet the requirements for High Performance Sustainable Buildings for New Construction points for the following Sections:

1. 2-6.1.1 - Recycled Content

2. The contractor is expected to understand the HPSB requirements for these sections and include all applicable overhead in their base bid for the necessary documentation to achieve the above listed credits.

1.02 RELATED REQUIREMENTS

A. Section 01 3325 - Project Sustainability Summary

B. Section 01 3329 - Sustainable Design Reporting

C. Section 01 6000 - Product Requirements

D. Section 01 7419 - Construction Waste Management and Disposal

E. Section 033000 - Cast-in-Place Concrete: Placement of anchors in concrete.

F. Section 099123 - Interior Painting: Paint finish.

1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design 2010.

B. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless 2022.

C. ASTM B429/B429M - Standard Specification for Aluminum-Alloy Extruded Structural Pipe and Tube 2020.

D. ASTM B483/B483M - Standard Specification for Aluminum and Aluminum-Alloy Drawn Tube and Drawn Pipe for General Purpose Applications 2021.

E. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings 2021.

F. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination 2020.

G. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel AC172 2019.

H. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer 2004.

1.04 SUBMITTALS

A. See Section 01 3001 - Submittals, for submittal procedures.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.

C. Sustainability Submittals, Product data for HPSB Compliance:

1. For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content.

a. Include statement indicating costs (sell price for each product having recycled content)

b. Include total weight of products provided

1.05 QUALITY ASSURANCE

A. Structural Designer Qualifications: Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located, or personnel under direct supervision of such an engineer.

B. Fabricator Qualifications:

1. A company specializing in manufacturing products specified in this section, with not less than five years of documented experience.

1.06 SUSTAINABILITY REQUIREMENTS

A. Contractor shall endeavor to provide materials with a high recycled content.

1. A minimum post-consumer recycled content of 30% is required.

PART 2 PRODUCTS

2.01 RAILINGS - GENERAL REQUIREMENTS

A. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of applicable local code.

B. Distributed Loads: Design railing assembly, wall rails, and attachments to resist distributed force of 75 pounds per linear foot (1095 N/m) applied to the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E935

C. Concentrated Loads: Design railing assembly, wall rails, and attachments to resist a concentrated force of 200 pounds (890 N) applied at any point on the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E935

D. Allow for expansion and contraction of members and building movement without damage to connections or members.

E. Dimensions: See drawings for configurations and heights.

1. Top Rails and Wall Rails: 1-1/2 inches (38 mm) diameter, round.

2. Intermediate Rails: 1-1/2 inches (38 mm) diameter, round.

3. Posts: 1-1/2 inches (38 mm) diameter, round.

F. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.

1. For anchorage to concrete, provide inserts to be cast into concrete, for bolting anchors.

2. For anchorage to stud walls, provide concealed wood blocking.

3. Posts: Provide adjustable flanged brackets.

2.02 STEEL RAILING SYSTEM

A. Steel Pipe: ASTM A53/A53M Grade B Schedule 40, black finish.

B. Non-Weld Mechanical Fittings: Slip-on, galvanized malleable iron castings, for Schedule 40 pipe, with flush setscrews for tightening by standard hex wrench, no bolts or screw fasteners.

C. Exposed Fasteners: Flush countersunk screws or bolts; consistent with design of railing.

D. Straight Splice Connectors: Steel concealed spigots.

E. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

F. Fabricate is maximum of 60" long individual sections to allow for easy removal.

G. Accessories:

1. Provide manufacturer's standard wrap-over-edge base mount assembly with set screw to allow for easy removal.

2. Fabricate railing with 4" high safety toe kick per details. Toe kick is intended to be integral with and attached to removable guardrail assembly.

3. Provide safety chain at ladder access point as indicated on the drawings. Provide hasp on guardrail posts for attachment of safety chain.

2.03 FABRICATION

A. Accurately form components to suit specific project conditions and for proper connection to building structure.

B. Fit and shop assemble components in largest practical sizes for delivery to site.

C. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

A. Supply items required to be cast into concrete or embedded in masonry with setting templates, for installation as work of other sections.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.

C. Install railings in compliance with ADA Standards for accessible design at applicable locations.

D. Anchor railings securely to structure.

E. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch (6 mm) per floor level, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch (6 mm).

C. Maximum Out-of-Position: 1/4 inch (6 mm).

END OF SECTION

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SECTION 061000 - ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Non-structural dimension lumber framing.

B. Concealed blocking for miscellaneous items.

C. Roof-mounted curbs (Bid Option)

D. Roofing nailers (Bid Option)

E. Preservative treated wood materials.

F. Concealed wood blocking, nailers, and supports.

G. Materials included in this section shall meet the requirements for High Performance Sustainable Buildings for New Construction points for the following Sections:

1. 2-5.3.2 - Reduce Volatile Organic Compounds (VOC) Low-Emitting Materials
2. 2-6.1.2 - Biologically Based Products
3. The contractor is expected to understand the HPSB requirements for these sections and include all applicable overhead in their base bid for the necessary documentation to achieve the above listed credits.

1.02 RELATED REQUIREMENTS

A. Section 01 2300 - Bid Options

B. Section 01 3325 - Project Sustainability Summary

C. Section 01 3329 - Sustainable Design Reporting

D. Section 01 6000 - Product Requirements

E. Section 016116 - Volatile Organic Compound (VOC) Content Restrictions.

F. Section 01 7419 - Construction Waste Management and Disposal

G. Section 055000 - Metal Fabrications: Miscellaneous steel connectors and support angles for wood framing.

H. Section 076200 - Sheet Metal Flashing and Trim: Sill flashings.

1.03 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2016a.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2022.

C. ASTM D2898 - Standard Practice for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing 2010 (Reapproved 2017).

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2023.

E. AWPA U1 - Use Category System: User Specification for Treated Wood 2022.

F. PS 1 - Structural Plywood 2019.

G. PS 20 - American Softwood Lumber Standard 2021.

H. SPIB (GR) - Standard Grading Rules 2021.

1.04 SUBMITTALS

A. See Section 01 3001 - Submittals for submittal procedures.

B. Product Data: Provide technical data on wood preservative materials and application instructions.

C. Sustainability Submittals, Product data for HPSB Compliance:

1. For products having Biologically Based Products, documentation indicating percentages of Biologically-Based Products

2. For products containing VOCs, documentation (material safety data sheets (MSDS), third-party certificates, or test reports) showing printed statement of VOC content.

1.05 DELIVERY, STORAGE, AND HANDLING

A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, or installation.

1.06 SUSTAINABILITY REQUIREMENTS

A. Contractor shall endeavor to provide materials with a high Biobased content where possible.

1. See Part 2 of this specification section for specific biobased content thresholds, if applicable

B. Contractor shall endeavor to provide materials with the lowest possible VOC content.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.

1. Species: Southern Pine, unless otherwise indicated.

2. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.

3. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

B. Lumber products shall have a minimum Biobased content of 25% as defined by the USDA.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

A. Grading Agency: Southern Pine Inspection Bureau, Inc; SPIB (GR).

B. Sizes: Nominal sizes as indicated on drawings, S4S.

C. Moisture Content: S-dry or MC19.

D. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:

1. Lumber: S4S, No. 2 or Standard Grade.

2. Boards: Standard or No. 3.

2.03 CONSTRUCTION PANELS

A. Communications and Electrical Room Mounting Boards: PS 1 A-D plywood, or medium density fiberboard; 3/4 inch (19 mm) thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.

2.04 ACCESSORIES

A. Fasteners and Anchors:

1. Metal and Finish: Hot-dipped galvanized steel complying with ASTM A153/A153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.

2. Provide Type 304 or 316 stainless-steel fasteners for exterior use and for both interior and exterior use where fastening into fire-retardant treated wood.

2.05 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.

1. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.

2. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

B. Fire Retardant Treatment:

1. Interior Type A: AWPA U1, Use Category UCFA, Commodity Specification H, low temperature (low hygroscopic) type, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes.

a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.

b. Treat rough carpentry items as indicated .

c. Do not use treated wood in applications exposed to weather or where the wood may become wet.

C. Preservative Treatment:

1. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative.

   a. Kiln dry lumber after treatment to maximum moisture content of 19 percent.

   b. Treat lumber in contact with roofing, flashing, or waterproofing.

   c. Treat lumber in contact with masonry or concrete.

   d. Treat lumber less than 18 inches (450 mm) above grade.

2. Preservative Pressure Treatment of Plywood Above Grade: AWPA U1, Use Category UC2 and UC3B, Commodity Specification F using waterborne preservative.

   a. Kiln dry plywood after treatment to maximum moisture content of 19 percent.

   b. Treat plywood in contact with roofing, flashing, or waterproofing.

   c. Treat plywood in contact with masonry or concrete.

   d. Treat plywood less than 18 inches (450 mm) above grade.

PART 3 EXECUTION

3.01 PREPARATION

A. Where wood framing bears on cementitious foundations, install full width sill flashing continuous over top of foundation, lap ends of flashing minimum of 4 inches (100 mm) and seal.

B. Coordinate installation of rough carpentry members specified in other sections.

C. Comply with all applicable codes for combustible material limitations.

3.02 INSTALLATION - GENERAL

A. Select material sizes to minimize waste.

B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.03 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

B. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.

3.04 ROOF-RELATED CARPENTRY

A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.

B. Provide wood curb at all roof openings except where prefabricated curbs are specified and where specifically indicated otherwise. Form corners by alternating lapping side members.

3.05 INSTALLATION OF CONSTRUCTION PANELS

A. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches (610 mm) on center on all edges and into studs in field of board.

1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.

2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.

3. Install adjacent boards without gaps.

4. Size and Location: As indicated on drawings.

3.06 TOLERANCES

A. Framing Members: 1/4 inch (6 mm) from true position, maximum.

B. Variation from Plane (Other than Floors): 1/4 inch in 10 feet (2 mm/m) maximum, and 1/4 inch in 30 feet (7 mm in 10 m) maximum.

3.07 CLEANING

A. Waste Disposal: Comply with the requirements of Section 017419 - Construction Waste Management and Disposal.

1. Comply with applicable regulations.

2. Do not burn scrap on project site.

3. Do not burn scraps that have been pressure treated.

4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or "waste-to-energy" facilities.

B. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.

C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION

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SECTION 064100 - ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cabinet hardware.

B. Plastic Laminate Casework

C. Materials included in this section shall meet the requirements for High Performance Sustainable Buildings for New Construction points for the following Sections:

1. 2-5.3.2 - Reduce Volatile Organic Compounds (VOC) Low-Emitting Materials

2. The contractor is expected to understand the HPSB requirements for these sections and include all applicable overhead in their base bid for the necessary documentation to achieve the above listed credits.

1.02 RELATED REQUIREMENTS

A. Section 01 3325 - Project Sustainability Summary

B. Section 01 3329 - Sustainable Design Reporting

C. Section 01 6000 - Product Requirements

D. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

E. Section 01 7419 - Construction Waste Management and Disposal

F. Section 06 1000 - Rough Carpentry: Support framing, grounds, and concealed blocking.

G. Section 12 3600 - Countertops and Window Sills

1.03 REFERENCE STANDARDS

A. ANSI A208.1 - American National Standard for Particleboard; 2009.

B. ANSI A208.2 - American National Standard for Medium Density Fiberboard for Interior Use; 2009.

C. BHMA A156.9 - American National Standard for Cabinet Hardware; Builders Hardware Manufacturers Association; 2010 (ANSI/BHMA A156.9).

D. GSA CID A-A-1936 - Adhesive, Contact, Neoprene Rubber; Federal Specifications and Standards; Revision A, 1996.

E. NEMA LD 3 - High-Pressure Decorative Laminates; National Electrical Manufacturers Association; 2005.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting not less than one week before starting work of this section; require attendance by all affected installers.

1.05 SUBMITTALS

A. See Section 01 3001 - Submittals, for submittal procedures.

B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.

1. Minimum Scale of Detail Drawings: 1-1/2 inch to 1 foot (1:8).

C. Samples: Submit actual samples of architectural cabinet construction, minimum 12 inches (300 mm) square, illustrating proposed cabinet, countertop, and shelf unit substrate and finish.

D. Samples: Submit actual sample items of proposed pulls, hinges, shelf standards, and locksets, demonstrating hardware design, quality, and finish.

E. Sustainability Submittals, product data for HPSB Compliance:

1. For products containing VOCs, documentation (material safety data sheets (MSDS), third-party certificates, or test reports, showing printed statement of VOC content.

2. VOC Content Limitations: For the specified products, submit documentation of conformance with Specification Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

1.06 QUALITY ASSURANCE

A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.

1. Company with at least one project in the past 5 years with value of woodwork within 20 percent of cost of woodwork for this Project.

1.07 MOCK-UP

A. Provide full size mock-up of typical base cabinet, wall cabinet, and countertop, including hardware, finishes, and plumbing accessories.

B. Mock up may remain as part of the Finished work once accepted by the Government

1.08 DELIVERY, STORAGE, AND HANDLING

A. Protect units from moisture damage.

1.09 FIELD CONDITIONS

A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

1.10 WARRANTY

A. 10 year written warranty on all products in this section for full replacement due to failure.

1.11 MANUFACTURER QUALIFICATION

A. Reputable manufacturer with documented experience manufacturing cabinets of equal size, quantity, scope, and quality for a period of not less than 5 years.

PART 2 PRODUCTS

2.01 CABINETS

A. Plastic Laminate Faced Cabinets: Custom grade.

B. Cabinets as indicated on drawings:

1. Finish - Exposed Exterior Surfaces: Decorative laminate.
2. Finish - Exposed Interior Surfaces: Decorative laminate.
3. Finish - Concealed Surfaces: Manufacturer's option.
4. Door edges, Drawer edges, Front of cabinet edges, Shelves edges, and Cabinet Face Profiles: 3 mm thick, factory adhered.
5. Casework Construction Type: Type A - Frameless.
6. Interface Style for Cabinet and Door: Style 1 - Overlay; reveal overlay.

7. Cabinet Design Series: As indicated on drawings.
8. Adjustable Shelf Loading: 50 lbs. per sq. ft..
    a. Deflection: L/144.
9. Cabinet Doors and Drawer Fronts: Flush style.
10. Drawer Side Construction: Doweled or dovetail sides ,sub fronts, and backs together.
11. Refer to finish schedule on the drawings for color selection.

2.02 LAMINATE MATERIALS

A. Thermally Fused Laminate (TFL): NEMA LD 3, Type VGL laminate panels.

B. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications.

C. Provide specific types as scheduled.

1. Horizontal Surfaces: HGS, 0.048 inch (1.22 mm) nominal thickness, colors as scheduled, finish as scheduled.
2. Vertical Surfaces: VGS, 0.028 inch (0.71 mm) nominal thickness, colors as scheduled, finish as scheduled.
3. Cabinet Liner: CLS, 0.020 inch (0.51 mm) nominal thickness, through color, colors as scheduled, finish as scheduled.
4. Laminate Backer: BKL, 0.020 inch (0.51 mm) nominal thickness, undecorated; for application to concealed backside of panels faced with high pressure decorative laminate.

2.03 COUNTERTOPS

A. Quartz Countertops - Refer to Section 12 3600.

2.04 ACCESSORIES

A. Adhesive: Type recommended by fabricator to suit application.

B. Plastic Edge Banding: Extruded PVC, flat shaped; smooth finish; self-locking serrated tongue; of width to match component thickness.

1. Color: As selected by the Government from manufacturer's standard range.

2. Use at 3mm at all cabinet faces, doors, drawer fronts, and exposed edges.

C. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and stainless steel or chrome-plated finish in exposed locations.

D. Concealed Joint Fasteners: Threaded steel.

E. Grommets: Stainless steel grommets for cut-outs. For bidding purposes, calculate at least one per individual work surface unless noted otherwise. The actual locations must be approved by the Government.

F. Counter top bracket supports: Painted steel, per manufactures standard, comply with ADA

2.05 HARDWARE

A. Hardware: BHMA A156.9, types as recommended by fabricator for quality grade specified.

B. Adjustable Shelf Supports: Standard side-mounted system using multiple holes for pin supports and coordinated self rests, polished chrome finish, for nominal 1 inch (25 mm) spacing adjustments.

C. Drawer and Door Pulls: "U" shaped wire pull, stainless steel satin finish, 4 inch centers ("U" shaped wire pull, steel with chrome finish, 100 mm centers).

D. Cabinet Locks: Keyed cylinder, two keys per lock, master keyed, steel with chrome finish.

E. Drawer Slides:

1. Type: Full extension.

2. Static Load Capacity: Commercial grade.

3. Mounting: Side mounted.

4. Stops: Integral type.

5. Features: Provide self closing / soft close / stay closed type. (provide actual guide in mock up cabinet)

F. Hinges: five knuckle grade 1, 270 degrees - stainless steel satin finish , (provide actual hinge in cabinet mock up), provide manufactures recommended screws in all hinge screw holes.

G. Door Catches: Nylon roller spring catch, dual or self aligning.

2.06 FABRICATION

A. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.

B. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.

C. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.

D. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet (600 mm) from sink cut-outs.

   1. Apply laminate backing sheet to reverse side of plastic laminate finished surfaces.

E. Provide cutouts for plumbing fixtures. Verify locations of cutouts from on-site dimensions. Seal cut edges.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

B. Verify location and sizes of utility rough-in associated with work of this section.

3.02 INSTALLATION

A. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.

B. Use fixture attachments in concealed locations for wall mounted components.

C. Use concealed joint fasteners to align and secure adjoining cabinet units.

D. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch (1 mm). Do not use additional overlay trim for this purpose.

E. Secure cabinets to floor using appropriate angles and anchorages.

F. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.

3.03 ADJUSTING

A. Adjust installed work.

B. Adjust moving or operating parts to function smoothly and correctly.

3.04 CLEANING

A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

END OF SECTION

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SECTION 070100 - SPECIAL PROJECT ROOFING WARRANTY (BID OPTION)

PROJECT GENERAL CONTRACTOR'S ROOFING WARRANTY

NAME OF PROJECT: _____

LOCATION: _____

OWNER: _____

GENERAL CONTRACTOR: _____

ADDRESS: _____

DATE OF ACCEPTANCE: _____

DATE OF EXPIRATION: _____

A. The Roofing Contractor and General Contractor do hereby certify that the roofing and metal flashing work included in this contract was installed in strict accordance with all requirements of the plans and specifications and in accordance with approved roofing manufacturers recommendations and provide warranties in accordance with Warranty Requirements per UFC 3-110-03 (Latest Edition) and as specified in individual specifications.

B. The Roofing, Metal Wall Panel, & Metal Soffit Panel Contractor and General Contractor do hereby guarantee the roofing, wall panels, soffit panels, and metal flashing and associated work including but not limited to all flashing; roof decking and/or sheathing; all material used as a roof substrate or insulation over which roof is applied; metal work; flashing to be absolutely water tight and free from all leaks, due to faulty or defective materials and workmanship for a period of five (5) years, starting on the date of Beneficial Occupancy of the project. This guarantee does not extend to any deficiency which was caused by the failure of work which the general contractor or his assigns did not damage or did not accomplish or was not charged to accomplish.

C. Subject to the terms and conditions listed below, the Roofing Contractor and General Contractor also guarantee that during the Guarantee Period he will, at his own cost and expense, make or cause to be made such repairs to, or replacements of said work, in accordance with the roofing manufacturers recommendations as are necessary to correct faulty and defective work and/or materials which may develop in the work including, but not limited to: Blisters, delamination, exposed felts, ridges, wrinkles,

splits, warped insulation and/or loose flashing etc. in a manner pursuant to the total anticipated life of the roofing system and the best standards applicable to the particular roof type in value and in accordance with construction documents as are necessary to maintain said work in watertight conditions, and further, to respond on or within three (3) calendar days upon proper notification of leaks or defects by the Government.

1. Specifically excluded from this Guarantee are damages to the work, other parts of the building and building contents caused by: (1) lightning, windstorm with wind speeds above specified IBC code requirements, hailstorm and other unusual phenomena of the elements: and (2) fire. When the work has been damaged by any of the foregoing causes, the Guarantee shall be null and void until such damage has been repaired by the Roofing Contractor through the General Contractor, and until the cost and expense thereof has been paid by the Government or by the responsible party so designated.

2. During the Guarantee Period, if the Government allows alteration of the work by anyone other the Roofing Contractor through the General Contractor, including cutting, patching and maintenance in connection with penetrations, and positioning of anything on the roof, this Guarantee shall become null and void upon the date of said alterations, only for that specific are of the roof. If the Government engages the Roofing Contractor through the General Contractor to perform said alterations, the Guarantee shall not become null and void, unless the Roofing Contractor through the General Contractor, prior to proceeding with said work, shall have notified the Government in writing, showing reasonable cause for claim that said alterations would likely damage or deteriorate the work, thereby reasonably justifying a termination of this Guarantee.

3. Future building additions will not void this Guarantee, except for that portion of the future addition that might affect the work under this contract at the point of connection of the roof areas, and any damage caused by such addition. If this contract is for roofing of an addition to an existing building, then this guarantee covers the work involved at the point of connection with the existing roof.

4. During the Guarantee Period, if the original use of the roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray cooled surface, flooded basin, or other use of service more severe than originally specified, this Guarantee shall become null and void upon the date of said change.

5. The Government shall promptly notify the Roofing Contractor through the General Contractor of observed, known or suspected leaks, defects or deterioration, and shall afford reasonable opportunity for the Roofing Contractor and General

Contractor to inspect the work, and to examine the evidence of such leaks, defects or deterioration.

IN WITNESS THEREOF, this instrument has been duly executed this_____ day of the year_____.

_____	_____
Roofing Contractor's Authorized Signature	General Contractor's Authorized Signature
_____	_____
Typed Name and Title	Typed Name and Title
_____	_____
Notary Public	

END OF SECTION

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SECTION 072100 - THERMAL INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Board insulation at cavity wall construction and where indicated on the drawings.

1. Provide continuous board insulation on exterior side CMU wall substrate as required to achieve a minimum of R-7.5 and as indicated on drawings.

B. Materials included in this section shall meet the requirements for High Performance Sustainable Buildings for New Construction points for the following Sections:

1. 2-5.3.2 - Reduce Volatile Organic Compounds (VOC) Low-Emitting Materials

2. 2-6.1.2 - Biologically Based Products

3. The contractor is expected to understand the HPSB requirements for these sections and include all applicable overhead in their base bid for the necessary documentation to achieve the above listed credits.

1.02 RELATED REQUIREMENTS

A. Section 01 3325 - Project Sustainability Summary

B. Section 01 3329 - Sustainable Design Reporting

C. Section 01 6000 - Product Requirements

D. Section 016116 - Volatile Organic Compound (VOC) Content Restrictions.

E. Section 01 7419 - Construction Waste Management and Disposal

F. Section 04 2000 - Unit Masonry

1.03 REFERENCE STANDARDS

A. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation 2022.

B. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation 2014 (Reapproved 2019).

C. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board 2022a.

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2023.

E. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials 2022a, with Editorial Revision (2023).

F. ASTM E136 - Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750 °C 2022.

G. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials; National Fire Protection Association; 2006.

H. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Underwriters Laboratories Inc.; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 01 3001 - Submittals for submittal procedures.

B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.

C. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.

D. Sustainability Submittals, Product data for HPSB Compliance:

1. For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content.

    a. Include statement indicating costs (sell price for each product having recycled content

    b. Included total weight of products provided

2. For products having Biologically Based Products, documentation indicating percentages of Biologically-Based Products

3. For products containing VOCs, documentation (material safety data sheets (MSDS), third-party certificates, or test reports) showing printed statement of VOC content.

4. VOC Content Limitations: For the specified products, submit documentation of conformance with Specification Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

1.05 FIELD CONDITIONS

A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

1.06 SUSTAINABILITY REQUIREMENTS

A. Contractor shall endeavor to provide materials with a high recycled content.

B. For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content.

1. See Part 2 of this specification section for specific biobased content thresholds, if applicable.

C. Contractor shall endeavor to provide materials with a high Biobased content where possible.

1. See Part 2 of this specification section for specific biobased content thresholds, if applicable.

D. Contractor shall endeavor to provide materials with the lowest possible VOC content.

PART 2 PRODUCTS

2.01 GENERAL CONDITIONS

2.02 APPLICATIONS

A. Insulation Inside Exterior Masonry Cavity Walls Assemblies: Extruded polystyrene board.

B. FOAM BOARD INSULATION MATERIALS

1. Extruded Polystyrene (XPS) Board Insulation: Complies with ASTM C578 with either natural skin or cut cell surfaces.

a. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.

b. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.

c. R-value (RSI-value); 1 inch (25 mm) of material at 72 degrees F (22 C): 5 (0.88), minimum.

d. Board Size as required to coordinate with specified masonry anchor spacings.

e. Board Thickness as required to provide minimum R Value:

f. Board Edges: Square.

g. Board Density: 1.6 lb/cu ft (26 kg/cu m).

h. Minimum compressive strength: 25 PSI, ASTM D1621

i. Sustainability Requirements:

1) Minimum Biobased content per USDA: 7%

2) Minimum Recycled Content: Total Recovered Materials: 9%

C. ACCESSORIES

1. Adhesive: Type recommended by insulation manufacturer for application.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.

B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.02 BOARD INSTALLATION AT CAVITY WALLS

A. Apply adhesive to back of boards:

1. Full bed 1/8 inch (3 mm) thick.

B. Install boards to fit snugly between wall ties, Z clips, and other components .

C. Install boards horizontally on walls.

1. Place boards to maximize adhesive contact.

2. Butt edges and ends tightly to adjacent boards and to protrusions.

D. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.03 PROTECTION

A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION

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SECTION 075400 - THERMOPLASTIC MEMBRANE ROOFING (BID OPTION)

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Adhered system with thermoplastic roofing membrane.

B. Insulation, flat and tapered

C. Deck sheathing

D. Flashings

E. Roofing cant strips, stack boots, roofing expansion joints, and walkway pads.

F. Materials included in this section shall meet the requirements for High Performance Sustainable Buildings for New Construction points for the following Sections:

1. 2-6.1.1 - Recycled Contents.

2. The contractor is expected to understand the HPSB requirements for these sections and include all applicable overhead in their base bid for the necessary documentation to achieve the above listed credits.

1.02 RELATED SECTIONS

A. Section 01 2300 - Bid Options

B. Section 01 3325 - Project Sustainability Summary

C. Section 01 3329 - Sustainable Design Reporting

D. Section 01 6000 - Product Requirements

E. Section 01 7419 - Construction Waste Management and Disposal

F. Section 06 1000 - Rough Carpentry: Wood nailers and curbs.

G. Section 07 0100 - Special Project Roofing Warranty

H. Section 07 6200 - Sheet Metal Flashing and Trim.

I. Section 07 7100 - Roof Specialties

J. Division 21 - Plumbing Systems

K. Division 26 - Lightning Protection for Structures.

1.03 REFERENCE STANDARDS

A. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus; 2013.

B. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2010.

C. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use asSheathing; 2013.

D. ASTM D4434/D4434M - Standard Specification for Poly(Vinyl Chloride) Sheet Roofing; 2015.

E. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2014.

F. ASTM E1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces; 2011.

G. FM DS 1-28 - Wind Design; 2007.

H. NRCA (RM) - The NRCA Roofing Manual; 2017.

I. NRCA (WM) - The NRCA Waterproofing Manual; 2005.

J. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.

K. UL (FRD) - Fire Resistance Directory; current edition.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a conference 10 days before starting work of this section.

1. Review preparation and installation procedures and coordinating and scheduling required with related work.

1.05 SUBMITTALS

A. See Section 01 3001 - Submittals for submittal procedures.

B. Product Data: Provide data indicating membrane materials, flashing materials, insulation, vapor retarder, surfacing, fasteners, and manufacturers approved adhering materials.

C. Shop Drawings: Indicate joint or termination detail conditions, conditions of interface with other materials, and paver layout.

D. Samples for Verification: Submit two samples 12 inches by 12 inches in size illustrating insulation, colored coating, and an actual sample of membrane.

E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

F. Manufacturer's Installation Instructions: Indicate membrane seaming precautions and perimeter conditions requiring special attention.

G. Manufacturer's Field Reports: Indicate procedures followed, ambient temperatures, humidity, wind velocity during application, and supplementary instructions given.

H. Sustainability Submittals, Product data for HPSB Compliance:

1. For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content.

a. Include statement indicating costs (sell price for each product having recycled content)

b. Include total weight of products provided

I. Warranty:

1. Submit manufacturer warranty and ensure that forms have been completed in the Government's name and registered with manufacturer.

2. Submit installer's certification that installation complies with all warranty conditions for the waterproof membrane.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years of documented experience.

B. Installer Qualifications: Company specializing in performing the work of this section:

1. With minimum five years documented experience.

2. Provide written approved by membrane manufacturer prior to commencing with work.

C. PREINSTALLATION MEETING: The General Contractor shall schedule a preinstallation meeting with all subcontractors involved with roof and associated trades,

including the Contracting Officer, Contracting Officer Representative(s), the architect, the Government's roofing consultant, and the manufacturers technical representative. The contractor shall be responsible for coordinating and holding a pre-installation conference. The required attendees shall be the Contractor, all related sub-contractors, the waterproofing subcontractor, project manager, and superintendent, and the waterproofing manufacturer's representative, the Contracting Officer, Contracting Officer Representative(s), and Architect. Topics to be discussed include, but are not limited to delivery dates, specialty contractor skill sets and capabilities, work schedules, and approved submittals.

D. Roof Manufacturer's Field Technical Representative shall be present for the Roofing Pre-Installation Conference and shall perform routine site visits to observe roofing system installation. Each site visit will be followed by a written report from the Representative within 5 working days issued to the Roofing Subcontractor and be promptly forwarded to the GC for distribution to Team Members. Technical Representative shall perform final roof inspection followed with a written report for distribution to Team Members, Roofing Sub-contractor shall provide a minimum of five working days notice to Team Members through the GC of final roof inspection date to allow others to attend.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver products in manufacturer's original containers, dry, undamaged, with seals and labels intact.

B. Store products in weather protected environment, clear of ground and moisture.

1.08 FIELD CONDITIONS

A. Do not apply roofing membrane during unsuitable weather.

B. Do not apply roofing membrane when ambient temperature is below 40 degrees F (5 degrees C).

C. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.

D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

1.09 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Project roofing warranty - refer to section 07 0100, signed by the General Contractor. Present this warranty at the inspection for Beneficial Occupancy.

C. System Warranty: Provide manufacturer's system warranty agreeing to repair or replace roofing that leaks or is damaged due to wind or other natural causes.

1. Warranty Term: 20 years no dollar limit

2. For repair and replacement include costs of both material and labor in warranty.

3. Exceptions NOT Permitted:

a. Damage due to roof traffic.

b. Damage due to wind of speed greater than 72 mph (115 km/h) but less than 90 mph (145 km/h).

D. Provide all executed warranties at the inspection for Beneficial Occupancy.

E. Warranty shall be governed by the laws of the State of Alabama.

1.10 SUSTAINABILITY REQUIREMENTS

A. Contractor shall endeavor to provide materials with a high recycled content:

1. See Part 2 of this specification section for specific recycled content thresholds, if applicable.

PART 2 - PRODUCTS

2.01 ROOFING - UNBALLASTED APPLICATIONS

A. Thermoplastic Membrane Roofing: One ply membrane, fully adhered, over cover board fastened to existing roof decking through existing roof assembly intended to remain in place.

B. Roofing Assembly Requirements:

1. Roof Covering External Fire Resistance Classification: UL Class A.

2. Factory Mutual Classification: Class I and windstorm resistance of I-90, in accordance with FM DS 1-28.

C. Recycled Content: Minimum of 10% Total Recovered Materials Content

2.02 ROOFING MEMBRANE AND ASSOCIATED MATERIALS

A. Membrane

1. Material: Polyvinyl chloride complying with ASTM D4434/D4434M.
2. Reinforcing: Internal fabric.
3. Thickness: 80 MIL Thickness
4. Sheet Width: Factory fabricated into largest sheets possible.
5. Solar Reflectance: 0.75, minimum, initial, and 0.65, minimum, 3-year, certified by Cool Roof Rating Council.
6. Thermal Emissivity: 0.80, minimum, initial, and 0.79, minimum, 3-year, certified by Cool Roof Rating Council.
7. Color: White.

B. Seaming Materials: As recommended by membrane manufacturer.

C. Vapor Retarder: Material approved by roof manufacturer complying with requirements of fire rating classification; compatible with roofing and insulation materials.

D. Flexible Flashing Material: Same material as membrane.

E. Flashings Membrane:

1. Shall be .060 inch (1.52 mm)-thick unsupported membrane for field-fabricated details used for making field flashings that require higher extensibility than is allowed with scrim-reinforced membrane. Typical application examples include inside and outside corners, vent stacks, and other penetrations.

2.03 DECK SHEATHING AND COVER BOARDS or RECOVERY BOARD

A. Deck Sheathing and Cover Board: Glass mat faced gypsum panels, ASTM C1177/C1177M, fire resistant type, 1/2 inch (6 mm) thick at roof and 1/2 inch vertical applications.

2.04 ACCESSORIES

A. Stack Boots: Prefabricated flexible boot and collar for pipe stacks through membrane; same material as membrane.

B. Cant and Edge Strips: Wood fiberboard, compatible with roofing materials; cants formed to 45 degree angle.

C. Membrane Adhesive: As recommended by membrane manufacturer.

D. Thinners and Cleaners: As recommended by adhesive manufacturer, compatible with membrane.

E. Insulation Adhesive: As recommended by insulation manufacturer.

F. Sealants: As recommended by membrane manufacturer.

G. Provide ES-1 wind rated manufacturers metal transition systems with welded miters; where required.

1. Refer to section 07 7100 - Roof Specialties

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and site conditions are ready to receive work.

B. Verify deck is supported and secure.

C. Verify substrate is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.

D. Verify deck surfaces are dry and free of snow or ice.

E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and cant strips are in place.

F. Conduct infrared moisture scanning as outlined in paragraph 3.04 at beginning of construction and again prior to beginning installation of new roof assembly.

3.02 PREPARATION

A. Remove and replace areas indentified by the infrared moisture scanning, if required, as directed by the Government following moisture scanning outlined in paragraph 3.04.

3.03 INSTALLATION - GENERAL

A. Perform work in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.

B. Do not apply roofing membrane during unsuitable weather.

C. Do not apply roofing membrane when ambient temperature is outside the temperature range recommended by manufacturer.

D. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.

E. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

F. Coordinate this work with installation of associated counterflashings installed by other sections as the work of this section proceeds.

3.04 MEMBRANE APPLICATION

A. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.

B. Shingle joints on sloped substrate in direction of drainage.

C. Fully Adhered Application: Apply adhesive to substrate at rate required to meet uplift requirements. Fully embed membrane in adhesive except in areas directly over or within 3 inches (75 mm) of expansion joints. Fully adhere one roll before proceeding to adjacent rolls.

D. Overlap edges and ends and seal seams by contact adhesive, minimum 3 inches (75 mm). Seal permanently waterproof. Apply uniform bead of sealant to joint edge where required by membrane manufacturer.

E. Mechanical Attachment: Apply membrane and mechanical attachment devices in accordance with manufacturer's instructions utilizing continuous termination strips in locations required by manufacturer.

F. At intersections with vertical surfaces:

1. Install in accordance with NRCA Detail as approved by the Government and manufacturer.

G. Allow 12-inch minimum spacing between roof penetrations, curbs and perimeter walls to allow the use of Manufacturer's preformed and/or flexible flashings for Warrantied Detail.

H. Around roof penetrations, seal flanges and flashings with flexible flashing. Pitch pockets are NOT allowed on this project.

I. Coordinate installation of roof drains and sumps and related flashings.

3.05 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for general requirements for field quality control and inspection.

B. Require site attendance of roofing and insulation material manufacturers daily during installation of the Work.

C. Roofing Consulting Services:

1. The Government will engage the services of a Professional Roof Consultant. The Consultant must be listed as a Professional Member of the International Institute of Building Enclosure Consultants (IIBEC). The Consultant shall attend the pre-roofing/wall meeting and perform no less than three (3) inspections during the installation of the new metal wall panel system(s) (1-start up inspection, 2 –Interim inspection, 3 – Final inspection). The consultant must document all site visits with photographs and written reports. All reports shall be forwarded to the Government with documentation of the job progress and any deficiencies noted during the inspections. The Contractor will be required to make any and all repairs to deficiencies noted by the roofing consultant at no additional cost to the Government. Upon completion of all punch list items, the Roof Consultant shall provide a letter of certification to the Government stating the new wall/roof system has been installed per the requirements of the contract documents, manufacturer's requirements, and all warranty requirements.

D. Infrared Moisture Scanning:

1. If the bid option to recover the existing roof is awarded, the Government will conduct moisture scanning to verify any wet areas of the existing roof assembly that may require removal and replacement prior ot installation of new roof assembly.

2. The Government will emply a certified thermographer to conduct moisture scanning. Moisture scanning will be conducted at the onset of construction as well as not more than 60 days prior to scheduled start of roofing activities.

3. The initial moisture scanning at the onset of construction will be conducted to identify areas of moisture intrusion in the existing roof assembly present at the start of Construction which requires removal and replacement of existing roof substrate materials prior to installation of new roof assemblies. The thermographer will identify extents of moisture on site using spray paint on the roof surface. The thermographer will also provide a written report with areas noted on a roof plan, the total approximate extent of area to be replaced quantified, and provide

recommendations for removal and replacement pf substrate materials. Based upon the initial report, a request for proposal for removal and replacement of roofing substrate will be issued for pricing for consideration by the Government as a Contract Modification (if required).

4. The Contractor shall protect the existing roof assembly from further water infiltration during the course of construction especially in locations where the project scope requires removal of existing roof mounted equipment.

5. The second infrared moisture scan shall be coordinated to occur not more than 60 days prior to start installation of new roof system. The intent of the second moisture scan is to confirm extents of wet areas needing replacement immediately prior to installation of new roofing systems. The thermographer will identify extent of moisture on site using spray paint on the roof areas. A written report with extent with areas noted on a roof plan and approximate extents of area to be replaced quanitified will also be provided. If additional areas of moisture intrusion are noted by the second scan, the additional areas shall be removed and replaced at no additional cost to the Government.

E. Manufacturer's Technical Representative

1. The representative shall have authorization from manufacturer to approve field changes and be thoroughly familiar with the products and with installations in the geographical area where construction will take place. The manufacturer's representative shall be an employee of the manufacturer with at least 5 years experience in installing the roof system. The representative shall be available to preform field inspections and attend meetings as required herein, and as requested by the Government.

F. Manufacturer's Field Inspections

1. Manufacturer's technical representative shall visit the site as necessary during the installation process to assure panels, flashings, and other components are being installed in a satisfactory manner. Manufacturer's technical representative shall perform a field inspection during the first 20 square of roof panel installation and at Beneficial Occupancy prior to issuance of warranty, as a minimum, and as otherwise requested by the Government. Additional inspections shall not exceed one for 100 squares of total roof area with the exception that follow-up inspections of previously noted deficiencies or application errors shall be performed as requested by the Government. Each inspection visit shall include a review of the entire installation to date. After each inspection, a report, signed by the manufacturer's technical representative, shall be submitted to the Government

noting the overall quality of work, deficiencies and any other concerns, and recommended corrective actions in detail. Notify the Government a minimum of 3 workings days prior to site visit by manufacturer's technical representative.

3.06 INSPECTION

A. Destructive tests shall be performed daily on a 3 inches (76 mm) wide area of seam weld to verify sufficient peel strength. Verify seam strength and correct procedures and seams that do not provide watertight durable construction.

1. Destructive tests shall be dated, initialed by Field Super and stored at GC's Field Office in a container for Team Members' viewing. The GC shall store destructive test samples with project archives.

2. A properly welded seam will have membrane delamination from scrim prior to weld failure.

3. Additional destructive tests on welds shall be conducted for the first seam of the day, the first seam after the robot welder has been allowed to cool down, and after any extreme changes in weather conditions.

4. Upon completion of the installation, an inspection will be performed by a representative of the roofing manufacturer to ascertain that the roofing membrane system has been installed according to approved specifications and details. Upon approval of the project, a Warranty shall be written.

5. Roof Manufacturer's Field Technical Representative shall be present for the Roofing Pre-Installation Conference and shall perform routine site visits to observe roofing system installations. Each site visit will be followed by a written report form the Representative within 5 working days issued to the Roofing Subcontractor and be promptly forwarded to the GC for distribution to Team Members.

6. Roof Manufacturer's Technical Representative shall perform final Roof Inspection followed with a written report for distribution to Team Members. Roofing Sub-contractor shall provide a minimum of five working days notice to Team Members through the GC of final roof Inspection date to allow others to attend.

3.07 CLEANING

A. Remove bituminous markings from finished surfaces.

B. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and conform to their documented

instructions.

C. Repair or replace defaced or damaged finishes caused by work of this section.

3.08 PROTECTION

A. Protect installed products until completion of project.

B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

C. Touch-up, repair or replace damaged products before Beneficial Occupancy.

END OF SECTION

SECTION 076200 - SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fabricated sheet metal items, including flashings, counterflashings, other applications indicated on the drawings, and exterior penetrations and other items as required.

B. Materials included in this section shall meet the requirements for High Performance Sustainable Buildings for New Construction points for the following Sections:

1. 2-6.1.1 - Recycled Content

2. The contractor is expected to understand the HPSB requirements for these sections and include all applicable overhead in their base bid for the necessary documentation to achieve the above listed credits.

1.02 RELATED REQUIREMENTS

A. Section 01 2300 - Bid Options.

B. Section 01 6000 - Product Requirements

C. section 01 7419 - Construction Waste Management and Disposal

D. Section 061000 - Rough Carpentry: Wood nailers for sheet metal work.

E. Section 07 54000- Thermoplastic Membrane Roof

F. Section 077100 - Roof Specialties: Manufactured copings, flashings, and expansion joint covers.

G. Section 07 9000 - Joint Sealers.

H. Section 08 4113 - Aluminum-framed Entrances

I. Section 08 4313 - Aluminum-framed Storefronts

J. Section 08 4413 - Glazed Aluminum Curtain Walls

1.03 REFERENCE STANDARDS

A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2022.

B. ASTM C920 - Standard Specification for Elastomeric Joint Sealants 2018.

C. ASTM D4479/D4479M - Standard Specification for Asphalt Roof Coatings - Asbestos-Free 2007 (Reapproved 2018).

D. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free 2007 (Reapproved 2018).

E. SMACNA (ASMM) - Architectural Sheet Metal Manual 2012.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section.

1.05 SUBMITTALS

A. See Section 01 3001 - Submittals for Submittal procedures.

B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

C. Samples: Submit two samples in size illustrating metal finish color.

D. Submit details and mock-ups certified by manufacturer of outside and inside corner wall Flashing conditions.

E. Sustainability Submittals, Product data for HPSB Compliance:

1. For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content.

   a. Include statement indicating costs (sell price for each product having recycled content)

   b. Include total weight of products provided

1.06 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA (ASMM) and CDA A4050 requirements and standard details, except as otherwise indicated.

B. Maintain one copy of each document on site.

C. Fabricator andInstaller Qualifications: Company specializing in sheet metal work with 5 years ofdocumented experience.

D. Provide written verification that low slope roof flashing meets or exceeds ES-1. Increase thickness of flashings as required to obtain ES-1.

1.07 MOCK UP

A. Refer to 01 4000 - Provide installed roof sample on mock-up.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

B. Prevent contact with materials that could cause discoloration or staining.

1.09 PRE-ROOFING MEETING:

A. Organize and conduct a meeting at the construction site 2 weeks before scheduled start of roof system installation with roofing installer; installer of each component of related work, including deck or substrate construction, roof equipment, penetrations of roof deck, and other work integral with or adjacent to roofing; the architect; the Contracting Officer; the Contracting Officer Representative(s), roofing manufacturer's representative; the Government's roofing consultant; roofing contractor; and other parties involved with roofing system performance, independent testing agencies, and governing authorities.

1. Walk roof areas to review and discuss substrate preparation including repair of unacceptable surfaces, roof drainage, penetrations, equipment curbs, and work performed by other trades which requires coordination with roofing system.

2. Examine steel deck for proper flatness and slope, review structural capability for supporting roofing system and methods of fastening.

3. Review contract document requirements and submittals for roofing system, including roofing schedule, inspection and testing, and environmental conditions. Identify what are considered unacceptable weather conditions for roofing, and which governing regulations or insurance requirements will affect roofing system installation.

4. Document discussions in writing, including actions required, and distribute copy of reports to each meeting participant.

1.10 WARRANTIES:

A. Flashing warranty: Provide flashing warranty, agreeing to correct defects of materials.

1. Duration: Five (20) years from the date of completion.

B. Manufacturer's finish warranty:

1. Covering bare metal against rupture, structural failure and perforation due to normal atmospheric corrosion exposure.

2. Covering panel finish against cracking, checking, blistering, peeling, flaking, chipping, chalking and fading.

3. Duration: twenty (20) years

1.11 SUSTAINABILITY REQUIREMENTS

A. Contractor shall endeavor to provide materials with a high recycled content:

1. See Part 2 of this specification section for specific recycled content thresholds, if applicable.

PART 2 PRODUCTS

2.01 SHEET MATERIALS

A. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 gage thick base metal, shop pre-coated with PVDF coating.

1. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system. Provide manufacturer's standard prime coat on underside.

2. Color: As selected by the Government from the manufacturer's full range of available colors.

B. Pre-Finished Aluminum: ASTM B209 (ASTM B209M); 050 inch (1.30 mm) thick; plain finish shop pre-coated with modified silicone coating.

1. Surface: Smooth, Flat.

2. Fluoropolymer Coating: High Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system.

a. Color: As selected by the Government from the manufacturer's full range of available colors.

3. Concealed Finish: Pretreated with manufacturer's 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).

C. Provide Pre-Finished Galvanized Steel when in contact with steel products. Provide Prefinished Aluminum when in contact with Aluminum products.

D. Bond Membrane: Do not allow dissimilar metals to contact. Provide a manufacturer approved bond membrane between dissimilar metals.

E. Provide sheet metal in increased gage/thickness where required for cleats and as needed to meet applicable wind loading/ES-1 ratings.

F. Recycled Content, for steel products: Minimum Total Recovered Materials Content - 30%

2.02 ACCESSORIES

A. Fasteners: Same material and finish as flashing metal, with soft neoprene washers.

B. Underlayment: Refer to specification section 07 7100 Roof Specialties.

C. Primer: As recommended by manufacturer for application and specified finish.

D. Protective Backing Paint: Asphaltic mastic, ASTM D 4479 Type I.

E. Sealant to be Concealed in Completed Work: Non-curing butyl sealant.

F. Sealant to be Exposed in Completed Work: lastomeric sealant, 100 percent silicone with minimum movement capability of plus/minus 25 percent and recommended by manufacturer for substrates to be sealed; clear.

G. Sealant: Type II specified in Section 07 9005 - Joint Sealants.

H. Plastic Cement: Type I.

2.03 FABRICATION

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.

B. Fabricate cleats of same material as sheet, minimum 1 inches (25 mm) wide, interlocking with sheet. Provide continuous cleats where indicated on drawings and/or recommended by SMACNA.

C. Form pieces in longest possible lengths.

D. Hem exposed edges on underside 1/2 inch (13 mm); miter and seam corners.

E. Form material with flat lock seams, except where otherwise indicated; at moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.

F. Fabricate corners from one piece with minimum 18 inch (450 mm) long legs; seam for rigidity, seal with sealant.

G. Fabricate vertical faces with bottom edge formed outward 1/4 inch (6 mm) and hemmed to form drip.

H. Fabricate flashings to allow toe to extend 2 inches (50 mm) over roofing gravel. Return and brake edges.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.

B. Verify roofing termination and base flashings are in place, sealed, and secure.

3.02 PREPARATION

A. Install starter and edge strips, and cleats before starting installation.

B. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil (0.4 mm).

C. Protect against galvanic action between dissimilar metal contact surfaces as recommended by metal manufacturers.

3.03 INSTALLATION

A. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted..

B. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.

C. Seal metal joints watertight.

3.04 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements, for field inspection requirements.

B. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

C. Roofing Consulting Services:

1. The Government will engage the services of a Professional Roof Consultant. The Consultant must be listed as a Professional Member of the International Institute of Building Enclosure Consultants (IIBEC). The Consultant shall attend the pre-roofing/wall meeting and perform no less than three (3) inspections during the installation of the new metal wall panel system(s) (1-start up inspection, 2 –Interim inspection, 3 – Final inspection). The consultant must document all site visits with photographs and written reports. All reports shall be forwarded to the Government with documentation of the job progress and any deficiencies noted during the inspections. The Contractor will be required to make any and all repairs to deficiencies noted by the roofing consultant at no additional cost to the Government. Upon completion of all punch list items, the Roof Consultant shall provide a letter of certification to the Government stating the new wall/roof system has been installed per the requirements of the contract documents, manufacturer's requirements, and all warranty requirements.

END OF SECTION

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SECTION 076500 - WALL FLASHING

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including requirements of the Government's Solicitation and Division 01 Specifications Sections, apply to this Section.

B. Section 04 2000 – Unit Masonry

C. Section 07 6000 – Sheet Metal Flashing and Trim

1.02 SUMMARY

A. Section provides for a flexible rubberized asphalt, self –sealing through-wall flashing and wall flashing, and stainless steel 26 gauge terminations at all dissimilar masonry transitions and general horizontal masonry drainage.

B. In no case shall wall flashing be exposed to sun light. If drawings show the flashing exposed disregard. Wall flashing is <u>not</u> to be exposed to sun light.

1.03 REFERENCES

A. American Society for Testing and Materials

1. ASTM E 96 – Test Methods for Water Vapor Transmission of Materials.

2. ASTM D 570 – Test method for Water Absorption of Plastics.

3. ASTM E 154 – Test Method for Water Vapor Retarders used in contract with Earth Under Concrete Slabs, on Walls or as Ground Cover.

4. ASTM D 1004 – Test Method for Initial Tear Resistance of Plastic Film and Sheeting.

5. ASTM D 1938 – Test Method for Tear Propagation Resistance of Plastic Film and Thin Sheeting by a Single-Tear Method.

6. ASTM D 1876 - Test Method for Peel Resistance of Adhesives.

7. ASTM D 1970 – Standard Specifications for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.

8. ASTM D 412 – Test Methods for Vulcanized Rubber & Thermoplastic Rubbers and Thermoplastic Elastomers – Tension.

1.04 SUBMITTALS

A. Product Data and Shop Drawings: Submit for each product; Spec-Data®/Data Sheets, details and installation procedures.

B. Test Reports: Indicating compliance with the performance requirements of this section.

C. Samples of flashing.

D. Mock-up: Refer to section 04 2000 Unit Masonry.

E. Pre-installation meeting with Architect, Contracting Officer, Contracting Officer Representative(s), Contractor's Construction Manager, Window or Storefront Supplier, Masonry Contractor, Flashing Manufacturer, Waterproofing Subcontractor and others associated with the work.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Comply with manufacturer's recommendations for storage and handling of each product.

PART 2 PRODUCTS

2.01 MATERIALS

A. Through Wall Flashing as referred to on drawings: 40 mil total thickness, self-adhered flexible flashing installed in conjunction with stainless steel drip plate, terminate bar, and sealant. Provide mastic, adhesive, primers, seam tapes per manufacturers' instructions and specified warranties.

B. Performance Requirements:

1. Water Vapor Transmission: ASTM E 96, Method B-2.9 ng/m2sPa (0.05 perms) maximum.

2. Water Absorption: ASTM D 570 – Max 0.1% by weight.

3. Puncture Resistance: ASTM E 154 – 178 N (40 lbs.)

4. Tear Resistance:

   a. Initiation – ASTM D 1004 – min. 58 N (13.0 lbs) M.D.

b. Propagation – ASTM D 1938 – min. 40 N (9.0 lbs) M.D.

5. Lap Adhesion at -4°C (25°F): ASTM D 1876 – 880 N/M (5.0 lbs./in.) of width

6. Low Temperature Flexibility: ASTM D 1970 – Unaffected to -43°C (-45°F).

   a. Tensile Strength: ASTM D 412, Die C Modified – Min. 5.5 MPa (800 psi)

7. Elongation, Ultimate Failure of Rubberized Asphalt: ASTM D 412, Die C – Min. 200%.

8. ASTM C-836

9. ASTM E-2357

10. ASTM 330

C. Sealant for Termination Bar:

   1. Provide manufacturer's recommended sealant to ensure compatibility with Air Barrier product being provided.

D. Outside and inside corners - per manufacturer.

E. Flashing Weeps – Mortar Nets, etc. Refer to Section 04 2000 “Unit Masonry” for additional installation requirements.

F. Termination Bar, thru wall flashing at weeps, misc flashings.

   1. Stainless Steel Flashing and Special Sections: Provide 26 gauge stainless steel flashing termination strips with with sealant ledge as recommended by flashing manufacturer. Refer to flashing details on drawings.

G. Stainless Steel Drip Plate:

   1. 26 gage, type 304 stainless steel.

   2. Factory formed, hemmed drip edge.

   3. Prefabricated inside, outside corners and end dams.

   4. Install in conjunction with flexible through wall flashing. Refer to flashing details on drawings.

   5. Install in strict accordance with manufacturer recommendations

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine conditions, with installer present, for compliance with requirements for installation, tolerances and other specific conditions affecting performance of flashing. Remove all deleterious materials from surfaces to be flashed.

3.02 INSTALLATION

A. General: Install flashing to dry surfaces at air and surface temperatures of -4°C (25°F) and above in accordance with manufacturer's recommendations at locations indicated on Construction Documents.

B. Through Wall Flashing – Referred to on drawings as "Through Wall Flashing": All flashing and accessories shall be installed in accordance with manufacturer's printed instructions, contract documents.

C. Accessories:

1. When required by dirty or dusty site conditions or by surfaces having irregular or rough texture, apply surface conditioner by spray, brush, or roller at the rate recommended by manufacturer, prior to flashing installation. Allow surface conditioner to dry completely before flashing application.

2. Apply Primer by brush or heavy nap, natural-material roller at rate recommended by manufacturer prior to flashing installation. Allow primer to dry completely before flashing application.

3. Provide stainless steel termination bar with a full bed of manufacturer's recommended sealant at the top of all flexible flashing. Refer to drawings for detail.

4. Encapsulate stainless steel termination bar with the vapor permeable, fluid applied membrane air barrier per the manufacturer's strict instructions.

5. Refer to drawings for details.

6. Refer to manufacturers details for inside and outside wall flashing corners

END OF SECTION

SECTION 077100 - ROOF SPECIALTIES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Roof-edge specialties.
2. Roof-edge drainage systems.

B. Materials included in this section shall meet the requirements for High Performance Sustainable Buildings for New Construction points for the following Sections:

1. 2-6.1.1 - Recycled Content
2. The contractor is expected to understand the HPSB requirements for these sections and include all applicable overhead in their base bid for the necessary documentation to achieve the above listed credits.

1.02 RELATED REQUIREMENTS:

A. Section 01 2300 Bid Options

B. Section 01 3325 - Project Sustainability Summary

C. Section 01 3329 - Sustainable Design Reporting

D. Section 01 7419 - Construction Waste Management and Disposal

E. Section 05 5000 – Metal Fabrications

F. Section 06 1000 – Rough Carpentry

G. Section 07 5400 – Thermoplastic Membrane Roofing

H. Section 07 6200 – Sheet Metal Flashing and Trim

I. Section 07 9200 – Joint Sealants

1.03 PREINSTALLATION CONFERENCE:

A. Conduct conference at Project site.

B. Meet with Contracting Officer, Contracting Officer Representative, Architect, roofing-system testing and inspecting agency representative, roofing Installer, roofing-system

manufacturer's representative, Installer, and installers whose work interfaces with or affects roof specialties, including installers of roofing materials and accessories.

C. Examine substrate conditions for compliance with requirements, including flatness and attachment to structural members.

D. Review special roof details, roof drainage, and condition of other construction that will affect roof specialties.

1.04 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 roof specialties.

1. Include plans, elevations, expansion-joint locations, keyed details, and attachments to other work. Distinguish between plant- and field-assembled work.

2. Include details for expansion and contraction; locations of expansion joints, including direction of expansion and contraction.

3. Indicate profile and pattern of seams and layout of fasteners, cleats, clips, and other attachments.

4. Detail termination points and assemblies, including fixed points.

5. Include details of special conditions.

C. Samples: For each type of roof specialty and for each color and texture specified.

D. Samples for Initial Selection: For each type of roof specialty indicated with factory-applied color finishes.

E. Samples for Verification:

1. Include Samples of each type of roof specialty to verify finish and color selection, in manufacturer's standard sizes.

2. Include roof-edge specialties and roof-edge drainage systems made from 12-inch (300-mm) lengths of full-size components in specified material, and including fasteners, cover joints, accessories, and attachments.

F. Sustainability Submittals, Product data for HPSB Compliance:

1. For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content.

    a. Include statement indicating costs (sell price for each product having recycled content)

    b. Include total weight of products provided

1.05 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer.

B. Product Certificates: For each type of roof specialty.

C. Product Test Reports: For roof-edge flashings for tests performed by a qualified testing agency.

D. Sample Warranty: For manufacturer's special warranty.

1.06 CLOSEOUT SUBMITTALS

A. Maintenance Data: For roofing specialties to include in maintenance manuals.

1.07 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer offering products meeting requirements that are FM Approvals listed for specified class and SPRI ES-1 tested to specified design pressure.

B. 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 roof edge, including fascia, gutter, and downspout approximately 10 ft. (3.0 m) 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 the Contracting Officer 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 Beneficial Occupancy.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Do not store roof specialties in contact with other materials that might cause staining, denting, or other surface damage. Store roof specialties away from uncured concrete and masonry.

B. Protect strippable protective covering on roof specialties from exposure to sunlight and high humidity, except to extent necessary for the period of roof-specialty installation.

1.09 FIELD CONDITIONS

A. Field Measurements: Verify profiles and tolerances of roof-specialty substrates by field measurements before fabrication, and indicate measurements on Shop Drawings.

B. Coordination: Coordinate roof specialties with flashing, trim, and construction of roof deck, roof and wall panels, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.10 WARRANTY

A. Roofing-System Warranty: See section 07 0100.

B. Special Warranty on Painted Finishes: Manufacturer agrees to repair finish or replace roof specialties that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:

   a. Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.

   b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.

   c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Beneficial Occupancy.

1.11 SUSTAINABILITY REQUIREMENTS

A. Contractor shall endeavor to provide materials with a high recycled content:

1. See Part 2 of this specification section for specific recycled content thresholds, if applicable.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. General Performance: Roof specialties shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.

B. Recycled Content: For Steel Products: Minimum Total Recovered Materials Content - 30%

C. FM Approvals' Listing: Manufacture and install roof-edge specialties that are listed in FM Approvals' "RoofNav" and approved for windstorm classification, Class 1-105. Identify materials with FM Approvals' markings.

D. SPRI Wind Design Standard: Manufacture and install roof-edge specialties tested in accordance with SPRI ES-1 and capable of resisting the following design pressures:

1. Design Pressure: As indicated on Drawings.

E. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of thermal movements. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C) material surfaces.

2.02 ROOF-EDGE SPECIALTIES

A. Canted Roof-Edge Gravel Stop: Manufactured, two-piece, roof-edge fascia consisting of snap-on metal fascia cover in section lengths not exceeding 12 ft. (3.6 m) and a continuous formed galvanized-steel sheet cant, 0.028 inch (0.71 mm) thick, minimum, with extended vertical leg terminating in a drip-edge cleat. Provide matching corner units.

1. Coordinate gravel stops with membrane roofing manufacturer to ensure compatibility and compliance with design wind speed/wind rating requirements.

2. Metallic-Coated Steel Sheet Gravel Stops: Zinc-coated (galvanized) steel, nominal thickness as required to meet performance requirements

a. Surface: Smooth, flat finish.

b. Finish: Three-coat fluoropolymer

c. Color: As selected by the Government from manufacturer's full range

3. Corners: Factory mitered and continuously welded.

4. Splice Plates: Concealed, of same material, finish, and shape as fascia cover.

2.03 ROOF-EDGE DRAINAGE SYSTEMS

A. Gutters: Manufactured in uniform section lengths not exceeding 12 ft. (3.6 m, with matching corner units, ends, outlet tubes, and other accessories. Elevate back edge at least 1 inch (25 mm) above front edge. Furnish flat-stock gutter straps, gutter brackets, expansion joints, and expansion-joint covers fabricated from same metal as gutters.

1. Zinc-Coated Steel: Nominal [0.028-inch (0.71-mm)] [0.034-inch (0.86-mm)] thickness.

2. Gutter Profile: As indicated on the drawings and in accordance with SMACNA's "Architectural Sheet Metal Manual."

3. Corners: Factory mitered and continuously welded.

4. Gutter Supports: Gutter brackets and Straps as recommended by manufacturer for application and required performance standards.

5. Special Fabrications: Radiused sections.

6. Gutter Accessories: Continuous snap-in plastic leaf guard

B. Downspouts: Plain rectangular complete with mitered elbows, manufactured from the following exposed metal. Furnish with metal hangers, from same material as downspouts, and anchors.

1. Zinc-Coated Steel: Nominal 0.034-inch (0.86-mm) thickness.

C. Zinc-Coated Steel Finish: Three-coat fluoropolymer

1. Color: As selected by the Government from manufacturer's full range

2.04 MATERIALS

A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A653/A653M, G90 (Z275) coating designation.

2.05 UNDERLAYMENT MATERIALS

A. Self-Adhering, High-Temperature Sheet: Minimum 30 to 40 Mils (0.76 to 1.0 mm) thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl of SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.

   1. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F (116 deg C).

   2. Low-temperature Flexibility: ASTM D 1970; passes after Testing at minus 20 deg F (29 deg C).

B. It shall be the roofing contractor's responsibility to verify with the roofing underlayment manufacturer that the products being provided and installed are approved to be installed on the roof pitch indicated on the drawings.

2.06 MISCELLANEOUS MATERIALS

A. Fasteners: Manufacturer's recommended fasteners, suitable for application and designed to meet performance requirements. Furnish the following unless otherwise indicated:

   1. Exposed Penetrating Fasteners: Gasketed screws with hex washer heads matching color of sheet metal.

   2. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Series 300 stainless steel or hot-dip zinc-coated steel in accordance with ASTM A153/A153M or ASTM F2329.

B. Elastomeric Sealant: ASTM C920, elastomeric silicone polymer sealant of type, grade, class, and use classifications required by roofing-specialty manufacturer for each application.

C. Butyl Sealant: ASTM C1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type joints with limited movement.

D. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

E. Asphalt Roofing Cement: ASTM D4586, asbestos free, of consistency required for application.

2.07 FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

D. Coil-Coated Galvanized-Steel Sheet Finishes:

1. High-Performance Organic Finish: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with ASTM A755/A755M and coating and resin manufacturers' written instructions.

a. Three-Coat Metallic Fluoropolymer: AAMA 621. Fluoropolymer finish with suspended metallic flakes containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

b. Concealed Surface Finish: Apply pretreatment and manufacturer's standard 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).

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.

B. Examine walls, roof edges, and parapets for suitable conditions for roof specialties.

C. Verify that substrate is sound, dry, smooth, clean, sloped for drainage where applicable, and securely anchored.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION OF UNDERLAYMENT

A. Self-Adhering Sheet Underlayment: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply wrinkle free, in shingle fashion to shed water, and with end laps of not less than 6 inches (152 mm) staggered 24 inches (610 mm) between courses. Overlap side edges not less than 3-1/2 inches (90 mm). Roll laps with roller. Cover underlayment within 14 days.

   1. Apply continuously under roof-edge specialties.

   2. Coordinate application of self-adhering sheet underlayment under roof specialties with requirements for continuity with adjacent air barrier materials.

3.03 INSTALLATION, GENERAL

A. Install roof specialties in accordance with manufacturer's written instructions. Anchor roof specialties securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, underlayments, sealants, and other miscellaneous items as required to complete roof-specialty systems.

   1. Install roof specialties level, plumb, true to line and elevation; with limited oil-canning and without warping, jogs in alignment, buckling, or tool marks.

   2. Provide uniform, neat seams with minimum exposure of solder and sealant.

   3. Install roof specialties to fit substrates and to result in weathertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.

   4. Torch cutting of roof specialties is not permitted.

   5. Do not use graphite pencils to mark metal surfaces.

B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.

   1. Coat concealed side of uncoated aluminum roof specialties with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.

   2. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof specialties for waterproof performance.

C. Expansion Provisions: Allow for thermal expansion of exposed roof specialties.

1. Space movement joints at a maximum of 12 ft. (3.6 m) with no joints within 18 inches (450 mm) of corners or intersections unless otherwise indicated on Drawings.

2. When ambient temperature at time of installation is 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.

D. Fastener Sizes: Use fasteners of sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

E. Seal concealed joints with butyl sealant as required by roofing-specialty manufacturer.

F. Seal joints as required for weathertight construction. Place sealant to be completely concealed in joint. Do not install sealants at temperatures below 40 deg F (4 deg C).

3.04 INSTALLATION OF ROOF-EDGE SPECIALTIES

A. Install cleats, cants, and other anchoring and attachment accessories and devices with concealed fasteners.

B. Anchor roof edgings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.

3.05 INSTALLATION OF ROOF-EDGE DRAINAGE-SYSTEM

A. Install components to produce a complete roof-edge drainage system in accordance with manufacturer's written instructions. Coordinate installation of roof perimeter flashing with installation of roof-edge drainage system.

B. Gutters: Join and seal gutter lengths. Allow for thermal expansion. Attach gutters to firmly anchored gutter supports spaced not more than 24 inches (610 mm) apart. Attach ends with rivets and seal with sealant to make watertight. Slope to downspouts.

1. Install gutter with expansion joints at locations indicated but not exceeding 50 ft. (15.2 m) apart. Install expansion-joint caps.

2. Install continuous leaf guards on gutters with noncorrosive fasteners, removable for cleaning gutters.

C. Downspouts: Join sections with manufacturer's standard telescoping joints. Provide hangers with fasteners designed to hold downspouts securely to walls and 1 inch (25 mm) away from walls; locate fasteners at top and bottom and at approximately 60 inches (1500 mm) o.c.

1. Connect downspouts to underground drainage system indicated.

3.06 CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder and sealants.

C. Remove temporary protective coverings and strippable films as roof specialties are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain roof specialties in a clean condition during construction.

D. Replace roof specialties that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION

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SECTION 078400 - FIRESTOPPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Firestopping of all joints and penetrations in fire resistance rated and smoke resistant assemblies, whether indicated on drawings or not.

B. Materials included in this section shall meet the requirements for High Performance Sustainable Buildings for New Construction points for the following Sections:

1. 2-5.3.2 - Reduce Volatile Organic Compounds (VOC) Low-Emitting Materials

2. The contractor is expected to understand the HPSB requirements for these sections and include all applicable overhead in their base bid for the necessary documentation to achieve the above listed credits.

1.02 RELATED REQUIREMENTS

A. Section 01 3325 - Project Sustainability SumMary

B. Section 01 3329 - Sustainable Design Reporting

C. Section 01 6000 - Product Requirements

D. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions

E. Section 04 2000 - Unit Masonry

1.03 REFERENCE STANDARDS

A. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials 2022.

B. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems 2013a (Reapproved 2017).

C. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems 2015 (Reapproved 2019).

D. ASTM E2174 - Standard Practice for On-Site Inspection of Installed Firestop Systems 2020a.

E. ASTM E2393 - Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers 2020a.

F. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi 2015, with Editorial Revision (2021).

G. ITS (DIR) - Directory of Listed Products Current Edition.

H. FM 4991 - Approval Standard of Firestop Contractors 2013.

I. FM (AG) - FM Approval Guide Current Edition.

J. SCAQMD 1168 - Adhesive and Sealant Applications 1989, with Amendment (2022).

K. UL 1479 - Standard for Fire Tests of Penetration Firestops Current Edition, Including All Revisions.

L. UL 2079 - Standard for Tests for Fire Resistance of Building Joint Systems Current Edition, Including All Revisions.

M. UL (DIR) - Online Certifications Directory Current Edition.

N. UL (FRD) - Fire Resistance Directory Current Edition.

1.04 SUBMITTALS

A. See Section 013001 - Submittals for submittal procedures

B. Schedule of Firestopping: List each type of penetration, fire rating of the penetrated assembly, and firestopping test or design number.

C. Product Data: Provide data on product characteristics, performance ratings, and limitations.

D. Manufacturer's Installation Instructions: Indicate preparation and installation instructions.

E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

F. Sustainability Submittals, Product data for HPSB Compliance:

1. For products containing VOCs, documentation (material safety data sheets (MSDS), third-party certificates, or test reports) showing printed statement of VOC content.

2. VOC Content Limitations: For the specified products, submit documentation of conformance with Specification Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

1.05 QUALITY ASSURANCE

A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.

1. Listing in UL (FRD), FM (AG), or ITS (DIR) will be considered as constituting an acceptable test report.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

C. Installer Qualifications: Company specializing in performing the work of this section and:

1. Trained by manufacturer.

2. Approved by Factory Mutual Research Corporation under FM 4991

3. Verification of minimum three years documented experience installing work of this type.

4. Verification of at least five satisfactorily completed projects of comparable size and type.

1.06 FIELD CONDITIONS

A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation; maintain minimum temperature before, during, and for three days after installation of materials.

B. Provide ventilation in areas where solvent-cured materials are being installed.

1.07 SUSTAINABILITY REQUIREMENTS

A. Contractor shall endeavor to provide materials with the lowest possible VOC content.

PART 2 PRODUCTS

2.01 MATERIALS

A. Volatile Organic Compound (VOC) Content: Provide products having VOC content lower than the requirements included in specification section 016116 - Volatile Organic Compound (VOC) Content Restrictions

B. Mold and Mildew Resistance: Provide firestoppping materials with mold and mildew resistance rating of zero(0) in accordance with ASTM G21.

C. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Provide type of materials as required for tested firestopping assembly.

D. Fire Ratings: Refer to drawings for required systems and ratings.

2.02 FIRESTOPPING ASSEMBLY REQUIREMENTS

A. Through Penetration Firestopping: Use system that has been tested according to ASTM E814 to have fire resistance F Rating equal to required fire rating of penetrated assembly.

1. Temperature Rise: Provide systems that have been tested to show T Rating as indicated.

2. Watertightness: Provide systems that have been tested to show W Rating as indicated.

3. Listing by FM (AG), ITS (DIR), UL (DIR), or UL (FRD) in their certification directories will be considered evidence of successful testing.

2.03 FIRESTOPPING PENETRATIONS THROUGH CONCRETE AND CONCRETE MASONRY CONSTRUCTION

A. Blank Openings:

1. In Floors or Walls:

a. 2 Hour Construction: UL System C-AJ-0090

b. 2 Hour Construction: UL System C-AJ-0015

c. 2 Hour Construction: UL System C-AJ-0116

d. 2 Hour Construction: UL System C-AJ-0136

B. Penetrations Through Floors or Walls By:

1. Multiple Penetrations in Large Openings:

a. 2 Hour Construction: UL System C-AJ-8143

b. 2 Hour Construction: UL System C-AJ-8035

c. 2 Hour Construction: UL System C-AJ-8055

d. 2 Hour Construction: UL System C-AJ-8093

e. 2 Hour Construction: UL System C-AJ-8114

f. 2 Hour Construction: UL System C-AJ-8115

g. 2 Hour Construction: UL System C-AJ-8181

h. 2 Hour Construction: UL System C-AJ-8220

2. Uninsulated Metallic Pipe, Conduit, and Tubing:

a. 2 Hour Construction: UL System C-AJ-1090

b. 2 Hour Construction: UL System C-AJ-1198

c. 2 Hour Construction: UL System C-AJ-1226

d. 2 Hour Construction: UL System C-AJ-1240

e. 2 Hour Construction: UL System C-AJ-1425

3. Uninsulated Non-Metallic Pipe, Conduit, and Tubing:

a. 2 Hour Construction: UL System C-AJ-2167

b. 2 Hour Construction: UL System C-AJ-2109;

c. 2 Hour Construction: UL System C-AJ-2106; Specified Technologies Inc. SSW wrap strips.

d. 2 Hour Construction: UL System C-AJ-2106

e. 2 Hour Construction: UL System C-AJ-2282

f. 2 Hour Construction: UL System C-AJ-2297

g. 2 Hour Construction: UL System C-AJ-2297; Specified Technologies Inc. SSW wrap strips.

h. 2 Hour Construction: UL System C-AJ-2298; Specified Technologies Inc. LCC Intumescent Firestop Collars.

i. 2 Hour Construction: UL System C-AJ-2298

j. 2 Hour Construction: UL System C-AJ-2588

k. 2 Hour Construction: UL System C-AJ-2772

l. 2 Hour Construction: UL System C-BJ-2021

4. Insulated Pipes:
    a. 2 Hour Construction: UL System C-AJ-5048
    b. 2 Hour Construction: UL System C-AJ-5087
    c. 2 Hour Construction: UL System C-AJ-5091
    d. 2 Hour Construction: UL System C-AJ-5138
    e. 2 Hour Construction: UL System C-AJ-5313
5. HVAC Ducts, Uninsulated:
    a. 2 Hour Construction: UL System C-AJ-7111

C. Penetrations Through Floors By:
1. Multiple Penetrations in Large Openings:
    a. 2 Hour Construction: UL System F-A-8012
2. Uninsulated Metallic Pipe, Conduit, and Tubing:
    a. 2 Hour Construction: UL System F-A-1129
3. Uninsulated Non-Metallic Pipe, Conduit, and Tubing:
    a. 2 Hour Construction: UL System F-A-2213
    b. 2 Hour Construction: UL System F-A-2216

D. Penetrations Through Walls By:
1. Uninsulated Metallic Pipe, Conduit, and Tubing:
    a. 2 Hour Construction: UL System W-J-1067
2. Electrical Cables Not In Conduit:
    a. 2 Hour Construction: UL System C-AJ-3095
    b. 2 Hour Construction: UL System C-AJ-3216
    c. 2 Hour Construction: UL System W-J-3090
    d. 2 Hour Construction: UL System W-J-3098; Specified Technologies Inc. EZ-Path Series 33 Fire-Rated Pathway.

e. 2 Hour Construction: UL System W-J-3098

f. 2 Hour Construction: UL System W-J-3130

g. 2 Hour Construction: UL System W-J-3138

h. 2 Hour Construction: UL System W-J-3141

i. 2 Hour Construction: UL System W-J-3156

j. 2 Hour Construction: UL System W-J-3158

k. 2 Hour Construction: UL System W-J-3180

l. 2 Hour Construction: UL System W-J-3182; Specified Technologies Inc. Ready Split Sleeve.

3. Insulated Pipes:

a. 2 Hour Construction: UL System C-AJ-5090

b. 2 Hour Construction: UL System C-AJ-5091

4. HVAC Ducts, Uninsulated:

a. 2 Hour Construction: UL System W-J-7092

b. 2 Hour Construction: UL System W-J-7109

5. HVAC Ducts, Insulated:

a. 2 Hour Construction: UL System W-J-7112

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify openings are ready to receive the work of this section.

3.02 PREPARATION

A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other materials that could adversely affect bond of firestopping material.

B. Remove incompatible materials that could adversely affect bond.

C. Install backing materials to prevent liquid material from leakage.

3.03 INSTALLATION

A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.

B. Do not cover installed firestopping until inspected by authorities having jurisdiction.

C. Install labeling required by code.

3.04 CLEANING

A. Clean adjacent surfaces of firestopping materials.

3.05 PROTECTION

A. Protect adjacent surfaces from damage by material installation.

END OF SECTION

SECTION 079005 - JOINT SEALERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sealants and joint backing.

B. Precompressed foam sealers.

C. Product Data for HPSB Compliance: For adhesives, incuding printed statement of VOC content.

D. Materials included in this section shall meet the requirements for High Performance Sustainable Buildings for New Construction points for the following Sections:

1. 2-5.3.2 - Reduce Volatile Organic Compounds (VOC) Low-Emitting Materials

2. The contractor is expected to understand the HPSB requirements for these sections and include all applicable overhead in their base bid for the necessary documentation to achieve the above listed credits.

1.02 RELATED REQUIREMENTS

A. Section 01 3325 - Project Sustainability Summary

B. Section 01 3329 - Sustainable Design Reporting

C. Section 01 6000 - Product Requirements

D. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions

E. Section 088000 - Glazing: Glazing sealants and accessories.

1.03 REFERENCE STANDARDS

A. ASTM C834 - Standard Specification for Latex Sealants 2017.

B. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications 2022.

C. ASTM C1193 - Standard Guide for Use of Joint Sealants 2016.

D. SCAQMD 1168 - Adhesive and Sealant Applications 1989, with Amendment (2022).

1.04 SUBMITTALS

A. Section 01 3001 - Submittals

B. Sustainability Submittals, Product data for HPSB Compliance:

1. For products containing VOCs, documentation (material safety data sheets (MSDS), third-party certificates, or test reports) showing printed statement of VOC content.

2. VOC Content Limitations: For the specified products, submit documentation of conformance with Specification Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

C. Product Data: Provide data indicating sealant chemical characteristics.

D. Samples, Submit two samples, in size required to illustrate sealant colors for selection.

E. Manufacturer's Installation Instructions: Indicate special procedures.

1.05 QUALITY ASSURANCE

A. Maintain one copy of each referenced document covering installation requirements on site.

B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum ten years documented experience.

C. Applicator Qualifications: Company specializing in performing the work of this section with minimum three years documented experience and approved by manufacturer.

1.06 MOCK-UP

A. Refer to 01 4000.

1.07 FIELD CONDITIONS

A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.08 WARRANTY

A. See Section 017800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective work within a the specified warranty periods.

1. Unless noted otherwise, provide manufacturer's standard 5 year material warranty.

2. Provide additional manufacturer's warranties listed for specific products.

C. Provide General Contractor's Project Joint Sealant Warranty at the back of this specification section. Warranty to be signed by the Joint Sealant Contractor and General Contractor.

D. Warranty: Include coverage for installed sealants and accessories which fail to achieve airtight seal and watertight seal, exhibit loss of adhesion or cohesion, or do not cure.

1.09 SUSTAINABILITY REQUIREMENTS

A. Contractor shall endeavor to provide materials with the lowest possible VOC content.

PART 2 PRODUCTS

2.01 SEALANTS

A. Sealants and Primers - General: Provide only products having lower volatile organic compound (VOC) content than required by South Coast Air Quality Management District Rule No.1168.

B. Type I - General Purpose Exterior Sealant: Silicone ; ASTM C 920, Grade NS, Class 25, Uses M ; single component, ultra low-mod.

1. Movement Capability: Plus 100 percent and minus 50 percent, minimum in accordance with ASTM C719

2. Non-Staining To Porous Stone: Non-staining to light-colored natural stone when tested in accordance with ASTM C1248.

3. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.

4. Hardness Range: 15 to 35, Shore A, when tested in accordance with ASTM C661.

5. Elongation: 1,000% when testing in accordance with ASTM D412

6. Tensile Strength: 120 psi, ultimate, when testing in accordance with ASTM D412

7. Tear Strength: 30ppi, ultimate, when testing in accordance with ASTM D624

8. Ozone/UV Resistance: Excellent.

9. Service Temperature Range: [-60] to [300] degrees F ([-51] to [149] degrees C).

10. Color: To be selected by the Government from manufacturer's full range.

11. Applications: Use for:

a. Vertical and horizontal construction joints between masonry/concrete/stone to masonry/concrete/stone.

12. Warranties: In addition to manufacturer's standard product warranties, Provide manufacturer's 20 year Non-Staining and 20 year Sructural Adhesion limited warranties. Provide manufacturer's compatibility testing as required.

C. Type II - General Purpose Exterior Sealant: Silicone ; ASTM C 920, Grade NS, Class 25, Uses M, G, and A; ot expected to withstand continuous water immersion or traffic.

1. Movement Capability: Plus and minus 50 percent, minimum.

2. Hardness Range: 15 to 35, Shore A, when tested in accordance with ASTM C661

3. Cure Type: Single-component, neutral moisture curing

4. Service Temperature Range: [-60 to 300] degrees F ([-51 to 149] degrees C).

5. Elongation: 700% when testing in accordance with ASTM D412

6. Tensile Strength: 200 psi, ultimate, when testing in accordance with ASTM D412

7. Tear Strength: 40 ppi, ultimate, when testing in accordance with ASTM D624

8. Peel Strength: 30 pli, when tested in accordance with ASTM C794

9. Ozone/UV Resistance: Excellent, when tested in accordance with ASTM D1149

10. Color: To be selected by the Architect from manufacturer's full range.

11. Applications: Use for:

a. All other vertical and horizontal construction joints not listed in sealant type I & III.

12. Warranties: In addition to manufacturer's standard product warranties, Provide manufacturer's 20 year Non-Staining and 20 year Structural Adhesion limited warranties. Provide manufacturer's compatibility testing as required.

D. Type III - Exterior Expansion Joint Sealer: Precompressed foam sealer; urethane with water-repellent;

1. Face color: match adjacent materials.

2. Size as required to provide weathertight seal when installed.

3. None staining in accordance with ASTM C510

4. Excellent UV Resistance
5. Excellent Resistance to Aging
6. Excellent Mildew Resistant
7. 21 psi min (145 kPa) tensile strength in accordance with ASTM D3574
8. 0.34 Btu. in/hr. ft^2 - ^oF (0.05 w/m ^oC) Thermal Conductivity in accordance with ASTM C518
9. Rate of Air Leakage Through Curtain Walls in accordance with ASTM E283: Passed.
10. Water Penetration of Curtain Walls by Uniform Static Air Pressure Difference in accordance with ASTM E331: Passed, up to 20.88 PSF
11. Structural Performance of Curtain Walls by Uniform Air Pressure Difference (Gust Loads) in accordance with ASTM E330: Passed: + 62.66 PSF, -56.39 PSF
12. Applications: Use for:
    a. Exterior wall expansion joints used in conjunction with sealant Type I.

E. Type IV - General Purpose Interior Sealant: Siliconized Acrylic Latex; ASTM C 834, Type OP, single component, paintable.

1. Extrudability, ASTM C1183: 6 g/s
2. Artificial Weathering, ASTM C732: Passes
3. Wash Out, ASTM C732: None
4. Slump:
    a. ASTM C732: None
    b. ASTM D2202: 2 mm
5. Cracking, ASTM C732: None
6. Discoloration, ASTM C732: None
7. Adhesion Loss, ASTM C732: None
8. Volume Shrinkage, ASTM C1241: 22.4% (Type OP), 35.3% (Type C)

9. Low Temp Flexibility, ASTM C734: Non cracks, no adhesion loss
10. Extension - Recovery, ASTM C736: 93.7%
11. Extension - Adhesion, ASTM C736: None
12. Stain Index, ASTM D2203: 0 mm
13. Movement Capability: +/-12.5%
14. Flame Spread, ASTM E84: 10
15. Smoke Development, ASTM E84: 0
16. Color: To be selected by the Architect from manufacturer's standard range.
17. Applications: Use for:
    a. Interior wall and ceiling control joints.
    b. Other interior joints for which no other type of sealant is indicated.

F. Type V - General Purpose Interior Sealant: Medium Modulus silicone sealant

1. Movement Capability: Plus and minus 50 percent, minimum.
2. Hardness Range: 15 to 35, Shore A, when tested in accordance with ASTM C661
3. Cure Type: Single-component, neutral moisture curing
4. Service Temperature Range: [-60 to 300] degrees F ([-51 to 149] degrees C).
5. Elongation: 700% when testing in accordance with ASTM D412
6. Tensile Strength: 200 psi, ultimate, when testing in accordance with ASTM D412
7. Tear Strength: 40 ppi, ultimate, when testing in accordance with ASTM D624
8. Peel Strength: 30 pli, when tested in accordance with ASTM C794
9. Ozone/UV Resistance: Excellent, when tested in accordance with ASTM D1149
10. Color: To be selected by the Architect from manufacturer's full range.
11. Color: To be selected by the Architect from manufacturer's standard range.
12. Applications: Use for:

a. Joints between aluminum door and window frames and adjacent wall surfaces.

G. Type VI - Bathtub/Tile Sealant: White silicone; ASTM C920, Uses M and A; single component, neutral curing, mildew resistant.

1. Cyclic Movement, ASTM C719: +/- 50
2. Elongation, Ultimate, ASTM D412: 450
3. Hardness (Shore A), ASTM C661: 25-35
4. Ozone/UV Resistance: Excellent
5. Peel Adhesion, ASTM C794: Pass
6. Service Temperature Rang (^{o}F): -60 to 100
7. Tensile Strength, ASTM C1135
   a. 100% Elongation (psi): 45-55
   b. Ultimate (psi): 165
8. Fungi Resistance, ASTM G21: No growth < 2 ug
9. Applications: Use for:
   a. Joints between plumbing fixtures and floor and wall surfaces.
   b. Joints between kitchen and bath countertops and wall surfaces.

H. Type VII - Interior Floor Joint Sealant: Polyurethane, self-leveling; ASTM C 920, Grade P, Class 25, Uses T, M and A; multi- component, type M

1. % Solids: 92%
2. Specific Gravity: 1.2
3. Extrusion Rate, ASTM C1183: 4 seconds
4. Hardness, ASTM C661: 30 to 35
5. Weight Loss, ASTM C1246: 12%
6. Stain and Color Change, ASTM C510: No visible color change, No stain
7. Accelerated Weathering, ASTM C793: Passes

8. Movement Capability, ASTM C719: +/- 25%
9. Tensile Strength, ASTM D412: 200 to 250 psi
10. Elongation, ASTM D412: 500 to 650%
11. Color: To be selected by the Architect from manufacturer's full range.
12. Applications: Use for:
    a. Expansion joints in floors.
    b. Joints between hard floor tile and hard floor tile and hard floor tile and adjacent wall surfaces for hard tile expansion joints.

I. Type VIII - Concrete Joint Sealant: Polyurethane; ASTM C 920, Class 50, Uses T, and M; multi- component (type M), Grade NS vertical and horizontal

1. % Solids: 92%
2. Specific Gravity: 1.06
3. Low Temp Flexibility, ASTM C793: Passes at -15 ^{o}F (-9° C)
4. Hardness, ASTM C661: 30 +/-3
5. Weight Loss, ASTM C1246: Passes
6. Stain and Color Change, ASTM C510: No color change, No stain
7. Adhesion-in-Peel, ASTM C794: >10 pli (pass)
8. Accelerated Weathering, ASTM C793: Passes
9. Movement Capability, ASTM C719: +/- 50%
10. Color: as selected by the Government from manufacturer's full range of colors..
11. Applications: Use for:
    a. Joints in sidewalks and curb and gutters
    b. Joints in concrete walls

2.02 ACCESSORIES

A. Primer: Non-staining type, recommended by sealant manufacturer to suit application, and compatible with joint substrates.

B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

C. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.

1. Type for Joints Not Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type O - Open Cell Polyurethane.

2. Type for Joints Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type B - Bi-Cellular Polyethylene.

3. Open Cell: 40 to 50 percent larger in diameter than joint width.

4. Closed Cell and Bi-Cellular: 25 to 33 percent larger in diameter than joint width.

5. All backer rods shall be as recommended by sealant manufacturer for specific use.

D. Tooling Agent: Agent recommended by material manufacturer to ensure contact of material with inner joint faces.

E. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application. Provide self adhering tape where applicable.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces and joint openings are ready to receive work.

B. Verify that joint backing and release tapes are compatible with sealant.

3.02 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.

B. Clean and prime joints in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

D. Protect elements surrounding the work of this section from damage or disfigurement.

3.03 INSTALLATION

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Perform installation in accordance with ASTM C1193.

C. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.

D. Install bond breaker where joint backing is not used.

E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.

F. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

G. Tool joints concave.

H. Precompressed Foam Sealant: Do not stretch; avoid joints except at corners, ends, and intersections; install with face 1/8 to 1/4 inch (3 to 6 mm) below adjoining surface.

3.04 CLEANING

A. Clean adjacent soiled surfaces.

3.05 PROTECTION

A. Protect sealants until cured.

3.06 FIELD QUALITY CONTROL

A. The Contractor will employ an independent testing agency to perform field quality control inspection and testing as specified below.

B. Non-Destructive Adhesion Testing: If there are any failures in first 100 linear feet (30 linear m), notify the Contracting Officer immediately.

C. Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.

D. Repair destructive test location damage immediately after evaluation and recording of results.

PROJECT JOINT SEALANT WARRANTY

PROJECT : _____

LOCATION: _____

OWNER : _____

WATERPROOFING CONTRACTOR: _____

ADDRESS: _____

DATE OF ACCEPTANCE: _____

DATE OF EXPIRATION: _____

A. The joint sealant contractor and general contractor do hereby certify that the above and underground work included in this contract was installed in strict accordance with all requirements of the plans and specifications and in accordance with approved joint sealants manufacturers' recommendations.

B. The joint sealant contractor and general contractor do hereby guarantee the joint sealants and associated work including but not limited to all above and underground vertical and horizontal joint sealants to be water tight and free from all leaks, due to faulty or defective materials and workmanship for a period of ten (10) years, starting on the date of Beneficial Occupancy of the project.

C. Subject to the terms and conditions listed below, the joint sealants contractor and general contractor also guarantee that during the guarantee period he will, at his own cost and expense, make or cause to be made such repairs to, or replacements of said work, in accordance with the joint sealant manufacturers recommendations as are necessary to correct faulty and defective work and/or materials which may develop in the work including. Anticipated life of the joint sealant systems and the best standards applicable to the particular joint sealant type in value and in accordance with construction documents as are necessary to maintain said work in watertight conditions, and further, to respond on or within seven (7) calendar days upon proper notification of leaks or defects by the Government.

D. During the guarantee period, if the Government allows alteration of the work by anyone other the joint sealant contractor or general contractor, including cutting, patching and maintenance in connection with penetrations, and positioning of anything affected by,

this guarantee shall become null and void upon the date of said alterations.

E. Future building additions will not void this guarantee, except for that portion of the future addition that might affect the work under this contract at the point of connection of the joint sealant areas, and any damage caused by such addition. If this contract is for joint sealant of an addition to an existing building, then this guarantee covers the work involved at the point of connection with the existing.

F. The Government shall promptly notify the Joint Sealant Contractor or General Contractor of observed, known or suspected leaks, defects or deterioration, and shall afford reasonable opportunity for the Joint Sealant Contractor or General Contractor to inspect the work, and to examine the evidence of such leaks, defects or deterioration.

IN WITNESS THEREOF, THIS INSTRUMENT HAS BEEN DULY EXECUTED THIS _____ DAY OF _____(YEAR).

_____	_____
GENERAL CONTRACTOR'S AUTHORIZED SIGNATURE	JOINT SEALANT CONTRACTOR'S AUTHORIZED SIGNATURE
_____	_____
TYPED NAME AND TITLE	TYPED NAME AND TITLE
_____	
NOTARY PUBLIC	

END OF SECTION

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Non-fire-rated hollow metal doors and frames.

B. Hollow metal frames for wood doors.

C. Fire-rated hollow metal doors and frames.

D. Thermally insulated hollow metal doors with frames.

E. Steel glazing frames.

F. Materials included in this section shall meet the requirements for High Performance Sustainable Buildings for New Construction points for the following Sections:

1. 2-6.1.1 - Recycled Content

2. The contractor is expected to understand the HPSB requirements for these sections and include all applicable overhead in their base bid for the necessary documentation to achieve the above listed credits.

1.02 RELATED REQUIREMENTS

A. Section 01 3325 - Project Sustainability Summary

B. Section 01 6000 - Product RequirementsContent Restrictions

C. Section 01 7419 - Construction Waste Management and Disposal

D. Section 04 2000 - Unit Masonry

E. Section 087100 - Door Hardware.

F. Section 088000 - Glazing: Glass for doors and borrowed lites.

G. Section 099113 - Exterior Painting: Field painting.

H. Section 099123 - Interior Painting: Field painting.

1.03 ABBREVIATIONS AND ACRONYMS

A. HMMA: Hollow Metal Manufacturers Association.

B. NFPA: National Fire Protection Association.

C. SDI: Steel Door Institute.

D. UL: Underwriters Laboratories.

1.04 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design 2010.

B. ANSI/ICC A117.1 - American National Standard for Accessible and Usable Buildings and Facilities; International Code Council; 2009.

C. ANSI/SDI A250.3 - Test Procedure and Acceptance Criteria for Factory Applied Finish Coatings for Steel Doors and Frames 2019.

D. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors 2022.

E. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100) 2017.

F. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames 2020.

G. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2022.

H. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable 2021a.

I. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength 2018a.

J. ASTM F2247 - Standard Test Method for Metal Doors Used in Blast Resistant Applications (Equivalent Static Load Method) 2018.

K. BHMA A156.115 - Hardware Preparation in Steel Doors and Steel Frames 2016.

L. ICC A117.1 - Accessible and Usable Buildings and Facilities 2017.

M. ITS (DIR) - Directory of Listed Products Current Edition.

N. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames 2002.

O. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames 2011.

P. NAAMM HMMA 840 - Guide Specifications For Receipt, Storage and Installation of Hollow Metal Doors and Frames 2017.

Q. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames 2014.

R. NFPA 80 - Standard for Fire Doors and Other Opening Protectives 2022.

S. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies 2022.

T. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames 2019.

U. UBC Std 7-2, Part II - Test Standard for Smoke- and Draft-control Assemblies; International Conference of Building Officials; 1997.

V. UL (DIR) - Online Certifications Directory Current Edition.

W. UL 10B - Standard for Fire Tests of Door Assemblies Current Edition, Including All Revisions.

X. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies Current Edition, Including All Revisions.

Y. UL 1784 - Standard for Air Leakage Tests of Door Assemblies Current Edition, Including All Revisions.

1.05 SUBMITTALS

A. See Section 01 3001 - Submittals for Submittal procedures.

B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.

C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.

D. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.

E. Sustainability Submittals, Product data for HPSB Compliance:

1. For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content.a

    a. Include statement indicating costs (sell price for each product having recycled content)Total weight of products provided

    b. Include total weight of products provided

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years documented experience.

B. Maintain at project site copies of reference standards relating to installation of products specified.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.

B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

1.08 SUSTAINABILITY REQUIREMENTS

A. Contractor shall endeavor to provide materials with a high recycled content:

1. See Part 2 of this specification section for specific recycled content thresholds, if applicable.

PART 2 PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Requirements for Hollow Metal Doors and Frames:

1. Steel Sheet: Comply with one or more of the following requirements; galvannealed steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.

2. Accessibility: Comply with ICC A117.1 and ADA Standards.

3. Exterior Door Top Closures: Flush end closure channel, with top and door faces aligned.

4. Door Edge Profile: Manufacturers standard for application indicated.

5. Typical Door Face Sheets: Flush.

6. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings. Style: Manufacturers standard.

7. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.

8. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.

B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

C. Product Performance:

1. Air leakage for fenestration and doors shall be determined in accordance with NFRX 400. Air leakage shall be determined by a laboratory accredited by a nationally recognized accreditation organization, such as the National Fenestration Rating Council, and shall be labeled and certified by the manufacturer.

   a. Air leakage shall not exceed 1.0 cfm/ft2 for glazed swinging entrance doors and 0.4 cfm/ft2 for all other products.

2. U-factors shall be determined in accordance with NFRC 100. U-Factors shall be determined by a laboratory accredited by a nationally recognized accreditation organization, such as the National Fenestration Rating Council, and shall be labeled and certified by the manufacturer.

   a. Assembly U-value for opaque doors shall not exceed 0.700.

3. Labeling of Doors: The U-factor and the air leakage rate for all manufactured doors installed between conditioned space, semi-heated space, unconditioned space, and exterior space shall be identified on a permanent name-plate installed on the product by the manufacturer.

D. UFC 04-010-01

1. Provide door/frame assemblies tested to achieve moderate level damage category in accordance with ASTM F 2247 as noted in section B-3.2.1 of UFC 4-010-01 at all exterior door applications. Comply with ASTM F 2247 where applicable.

2.02 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, CS, Type B; suitable for exposed applications.

B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, CS, Type B.

C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 or A40 metallic coating.

D. Recycled Content: For Steel Products: Minimum Total Recovered Materials Content - 30%

2.03 HOLLOW METAL DOORS

A. Type HM EXT,Exterior Doors: Thermally insulated.

1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).

a. Level 2 - Heavy-duty.

b. Insulated and designed to meet or exceed the requirements of UFC 4-010-01

c. Physical Performance Level B 500 000 cycles; in accordance with ANSI/SDI A250.4.

d. Model 1 - Full Flush.

e. Door Face Metal Thickness: 18 gage, 0.042 inch (1.0 mm), minimum., unless required otherwise for blast resistant doors

2. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.

3. Door Thickness: 1-3/4 inch (44.5 mm), nominal.

4. Insulating Value: U-value of 0.50, when tested in accordance with ASTM C 1363 .

5. Weatherstripping: Refer to Section 087100.

6. Door Finish: Factory primed and field finished.

B. Type F HM ,Interior Doors, Non-Fire-Rated:

1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).

   a. Level 2 - Heavy-duty.

   b. Physical Performance Level B 500 000 cycles; in accordance with ANSI/SDI A250.4.

   c. Model 1 - Full Flush.

   d. Door Face Metal Thickness: 18 gage, 0.042 inch (1.0 mm), minimum.

2. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.

3. Door Thickness: 1-3/4 inch (44.5 mm), nominal.

4. Door Finish: Factory primed and field finished.

C. Type F HM , Fire-Rated Doors:

1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).

   a. Level 2 - Heavy-duty.

   b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.

   c. Model 1 - Full Flush.

   d. Door Face Metal Thickness: 18 gage, 0.042 inch (1.0 mm), minimum.

2. Fire Rating: As indicated on Door Schedule, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").

   a. Provide units listed and labeled by UL (DIR) or ITS (DIR).

   b. Attach fire rating label to each fire rated unit.

3. Door Core Material: Manufacturers standard core material/construction in compliance with requirements.

4. Door Thickness: 1-3/4 inch (44.5 mm), nominal.

5. Door Finish: Factory primed and field finished.

D. Hardware Reinforcement: ANSI/SDI A250.6-1997.

2.04 HOLLOW METAL FRAMES

A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.

B. Exterior Door Frames: Full profile/continuously welded type.

1. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with A40/ZF120 coating.

2. Frame Metal Thickness: 14 gage, 0.067 inch (1.7 mm), minimum. unless required otherwise for blast resistance.

3. Weatherstripping in Hardware Specification Section: 08 7000.

C. Interior Door Frames, Non-Fire Rated: Full profile/continuously welded type.

1. Frame Metal Thickness: 16 gage, 0.053 inch (1.3 mm), minimum.

D. Door Frames, Fire-Rated: Knock-down type.

1. Fire Rating: Same as door, labeled.

E. Mullions for Pairs of Doors: Fixed, with profile similar to jambs.

F. Borrowed Lites Glazing Frames: Construction and face dimensions to match door frames, and as indicated on drawings.

G. Hardware Reinforcement: ANSI/SDI A250.6.

H. All frames are to wrap the entire wall. No butt conditions will be acceptable. Coordinate frame jamb depths with each wall condition.

2.05 ACCESSORIES

A. Glazing: As specified in Section 088000, factory installed.

B. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

C. Stops and Moldings:

1. Moldings for Glazed Lites in Doors & Windows: Minimum 0.032-inch (0.8 mm) thick, same material as door face sheet. Metal lite kits are to be flush and shall not require shim kits for door hardware.

2. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch (16 mm) high unless otherwise indicated.

3. Loose Stops for Glazed Lites in Frames: Minimum 0.032 inch (0.8 mm) thick, same material as frames.

D. Frame Anchors: ASTM A 591/A 591M, Commercial Steel (CS), 40Z 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.

a. Jamb Anchors:

1) Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch (1.0 mm) thick, with corrugated or perforated straps not less than 2 inches (50 mm) wide by 10 inches (250 mm) long; or wire anchors not less than 0.177 inch (4.5 mm) thick.

2) Compression Type for Drywall Slip-on Frames: Adjustable compression anchors.

b. Floor Anchors: Formed from same material as frames, not less than 0.042 inch (1.0 mm) 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 (50-mm) height adjustment. Terminate bottom of frames at finish floor surface.

E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

F. Grout: ASTM C 476, except with a maximum slump of 4 inches, as measured according to ASTM C 143/C 143M.

G. Mineral-Fiber Insulation: ASTM C 665, Type I.

2.06 FINISHES

A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

2.07 FABRICATION

A. Tolerances: Fabricate hollow metal work to tolerances indicated in SDI 117.

B. Hollow Metal Doors:

1. Exterior Doors: Provide weep-hole openings in bottom of exterior doors. Seal joints in top edges of doors against water penetration with flush door cap.

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.

C. Hollow Metal Frames: Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.

1. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.

2. Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.

3. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.

4. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.

5. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.

a. Stud-Wall Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as follows:

1) Three anchors per jamb up to 60 inches (1524 mm) high.

2) Four anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.

3) Five anchors per jamb from 90 to 96 inches (2286 to 2438 mm) high.

4) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 96 inches (2438 mm) high.

5) Two anchors per head for frames more than 42 inches (1066 mm) wide and mounted in metal-stud partitions.

6. Door Silencers: Except on weather-stripped doors, drill stops to receive door silencers.

   a. Single-Door Frames: Three door silencers.

   b. Double-Door Frames: Two door silencers.

D. Hardware Preparation: Factory prepare hollow metal work to receive templated mortised hardware according to the Door Hardware Schedule and templates furnished as specified in Division 8 Section "Door Hardware."

1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.

2. Reinforce doors and frames to receive non-templated, mortised and surface-mounted door hardware.

3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.

4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 16 electrical Sections.

E. 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.

4. Provide loose stops and moldings on inside of hollow metal work.

5. Coordinate rabbet width between fixed and removable stops with type of glazing and type of installation indicated.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 PREPARATION

3.03 INSTALLATION

A. Hollow Metal Frames and Stainless Steel Frames: Comply with ANSI/SDI A250.11.

1. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.

   a. 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.

   b. Install frames with removable glazing stops located on secure side of opening.

   c. Install door silencers in frames before grouting.

   d. Remove temporary braces necessary for installation only after frames have been properly set and secured.

   e. Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.

   f. Field apply bituminous coating to backs of frames that are filled with grout containing anti-freezing agents.

   g. Remove temporary “shipping spreader bars” before installation.

2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post installed expansion anchors.

   a. Floor anchors may be set with powder-actuated fasteners instead of post installed expansion anchors if so indicated and approved on Shop Drawings.

3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation behind frames.

4. Ceiling Struts: Extend struts vertically from top of frame at each jamb to overhead structural supports or substrates above frame unless frame is anchored to masonry or to other structural support at each jamb. Bend top of struts to provide flush contact for securing to supporting construction. Provide adjustable wedged or bolted anchorage to frame jamb members.

5. 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 (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.

    b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.

    c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.

    d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.

B. 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 (3 mm) plus or minus 1/16 inch (1.6 mm).

    b. Between Edges of Pairs of Doors: 1/8 inch (3 mm) plus or minus 1/16 inch (1.6 mm).

    c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch (9.5 mm).

    d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch (19 mm).

2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.

3. Smoke-Control Doors: Install doors according to NFPA 105.

C. Glazing: Comply with installation requirements in Division 8 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 (230 mm) o.c. and not more than 2 inches (50 mm) o.c. from each corner.

3.04 TOLERANCES

A. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 861.

B. Maximum Diagonal Distortion: 1/16 inch (1.6 mm) measured with straight edge, corner to corner.

3.05 ADJUSTING

A. Adjust for smooth and balanced door movement.

B. 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.

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.

3.06 SCHEDULE

A. Refer to Door and Frame Schedule on the drawings.

END OF SECTION

SECTION 081416 - FLUSH WOOD DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Flush wood doors; flush and flush glazed configuration; fire-rated and non-rated.

B. Materials included in this section shall meet the requirements for High Performance Sustainable Buildings for New Construction points for the following Sections:

1. 2-5.3.2 - Reduce Volatile Organic Compounds (VOC) Low-Emitting MaterialsThe contractor is expected to understand the HPSB requirements for these sections and include all applicable overhead in their base bid for the necessary documentation to achieve the above listed credits.

2. The contractor is expected to understand the HPSB requirements for these sections and include all applicable overhead in their base bid for the necessary documentation to achieve the above listed credits.

1.02 RELATED REQUIREMENTS

A. Section 01 3325 - Project Sustainability Summary

B. Section 01 3329 - Sustainable Design Reporting

C. Section 01 6000 - Product Requirements

D. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions

E. Section 01 7419 - Construction Waste Management and Disposal

F. Section 081113 - Hollow Metal Doors and Frames.

G. Section 087100 - Door Hardware.

H. Section 088000 - Glazing.

1.03 REFERENCE STANDARDS

A. AWI (QCP) - Quality Certification Program Current Edition.

B. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition 2014, with Errata (2016).

C. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards 2021, with Errata.

D. ICC (IBC) - International Building Code 2018.

E. NFPA 80 - Standard for Fire Doors and Other Opening Protectives 2022.

F. UL (BMD) - Building Materials Directory; Underwriters Laboratories Inc.; current edition.

G. WDMA I.S. 1A - Interior Architectural Wood Flush Doors 2021, with Errata (2022).

1.04 SUBMITTALS

A. See Section 01 3001 - Submittals for Submittal procedures.

B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.

C. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.

D. Samples: Submit two samples of door veneer, in size illustrating wood grain, stain color, and sheen.

E. Manufacturer's Installation Instructions: Indicate special installation instructions.

F. Warranty, executed in the Government's name.

G. Sustainability Submittals, Product data for HPSB Compliance:

1. For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content.

   a. Include statement indicating costs (sell price for each product having recycled content

   b. Total weight of products provided

2. For products having Biologically Based Products, documentation indicating percentages of Biologically-Based Products

3. For products containing VOCs, documentation (material safety data sheets (MSDS), third-party certificates, or test reports) showing printed statement of VOC content.

4. VOC Content Limitations: For the specified products, submit documentation of conformance with Specification Section 01 6116 - Volatile Organic Compound

(VOC) Content Restrictions.

1.05 QUALITY ASSURANCE

A. Maintain one copy of the specified door quality standard on site for review during installation and finishing.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with not less than three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Package, deliver and store doors in accordance with specified quality standard.

B. Accept doors on site in manufacturer's packaging. Inspect for damage.

C. Protect doors with resilient packaging sealed with heat shrunk plastic. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges with tinted sealer if stored more than one week. Break seal on site to permit ventilation.

1.07 WARRANTY

A. See Section 017800 - Closeout Submittals, for additional warranty requirements.

B. Interior Doors: Provide manufacturer's warranty for the life of the installation.

C. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

1.08 SUSTAINABILITY REQUIREMENTS

A. Contractor shall endeavor to provide materials with the lowest possible VOC content.

PART 2 PRODUCTS

2.01 DOORS AND PANELS

A. Doors: Refer to drawings for locations and additional requirements.

1. Quality Standard: Custom Grade, Heavy Duty performance, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

2. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.

B. Interior Doors: 1-3/4 inches (44 mm) thick unless otherwise indicated; flush construction.

1. Provide solid core doors at each location.

2. Wood veneer facing with factory transparent finish . Color shall match Government sample.

2.02 DOOR AND PANEL CORES

A. Non-Rated Solid Core: Type particleboard core (PC), plies and faces as indicated above.

B. Fire-Rated Doors: Mineral core type, with fire resistant composite core (FD), plies and faces as indicated above; with core blocking as required to provide adequate anchorage of hardware without through-bolting.

2.03 DOOR FACINGS

A. Veneer Facing for Transparent Finish: Select White oak, veneer grade in accordance with quality standard indicated, plain sliced (flat cut), with book match between leaves of veneer, running match of spliced veneer leaves assembled on door or panel face.

1. Vertical Edges: Same species as face veneer.

2. "Pair Match" each pair of doors; "Set Match" pairs of doors within 10 feet (3 m) of each other when doors are closed.

B. Facing Adhesive: Type I - waterproof.

2.04 DOOR CONSTRUCTION

A. Fabricate doors in accordance with door quality standard specified.

B. Cores Constructed with stiles and rails:

1. Provide solid blocks at lock edge and top of door for closer for hardware reinforcement.

2. Provide solid blocking for other throughbolted hardware.

C. Glazed Openings: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings.

D. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.

E. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.

F. Provide edge clearances in accordance with the quality standard specified.

2.05 FACTORY FINISHING - WOOD VENEER DOORS

A. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:

1. Transparent:

a. System - 12 Polyurethane Water-based.

b. Sheen: Satin.

B. Factory finish doors in accordance with approved sample.

C. Seal door top edge with color sealer to match door facing.

D. Color as selected by the Government for the manufacturer's full range of colors.

2.06 ACCESSORIES

A. Glazing Stops: Rolled steel channel shape, mitered corners; prepared for countersink style tamper proof screws.

B. Door Hardware: As specified in Section 087100.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 INSTALLATION

A. Install doors in accordance with manufacturer's instructions and specified quality standard.

1. Install fire-rated doors in accordance with NFPA 80 requirements.

B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.

C. Use machine tools to cut or drill for hardware.

D. Coordinate installation of doors with installation of frames and hardware.

E. Coordinate installation of glazing.

3.03 TOLERANCES

A. Comply with specified quality standard for fit and clearance tolerances.

B. Comply with specified quality standard for telegraphing, warp, and squareness.

3.04 ADJUSTING

A. Adjust doors for smooth and balanced door movement.

B. Adjust closers for full closure.

END OF SECTION

SECTION 083323 - OVERHEAD COILING DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Overhead coiling doors , operating hardware, exterior, electric operation.

B. Wiring from electric circuit disconnect to operator to control station.

C. Materials included in this section shall meet the requirements for High Performance Sustainable Buildings for New Construction points for the following Sections:

1. 2-6.1.1 - Recycled Content

2. The contractor is expected to understand the HPSB requirements for these sections and include all applicable overhead in their base bid for the necessary documentation to achieve the above listed credits.

1.02 RELATED REQUIREMENTS

A. Section 01 2300 - Bid Options

B. Section 01 3325 - Project Sustainability Summary

C. Section 01 6000 - Product Requirements

D. Section 087100 - Door Hardware: Cylinder cores and keys.

E. Applicable portions of Division 26 "Electrical" specifications.

1.03 REFERENCE STANDARDS

A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.

B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.

C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2022.

D. ITS (DIR) - Directory of Listed Products Current Edition.

E. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum) 2020.

F. NEMA ICS 2 - Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts 2008 (Reaffirmed 2020).

G. NEMA MG 1 - Motors and Generators 2021.

H. NFPA 80 - Standard for Fire Doors and Other Opening Protectives 2022.

I. UL (DIR) - Online Certifications Directory Current Edition.

1.04 SUBMITTALS

A. See Section 01 3001 - Submittals, for submittal procedures.

B. Product Data: Provide general construction, component connections and details, electrical equipment .

C. Shop Drawings: Indicate pertinent dimensioning, anchorage methods, hardware locations, and installation details.

D. Manufacturer's Instructions: Indicate installation sequence and procedures, adjustment and alignment procedures.

E. Maintenance Data: Indicate lubrication requirements and frequency and periodic adjustments required.

F. Sustainability Submittals, Product data for HPSB Compliance:

1. For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content.

a. Include statement indicating costs (sell price for each product having recycled content)

b. Total weight of products provided

1.05 QUALITY ASSURANCE

A. Products Requiring Electrical Connection: Listed and classified by testing firm acceptable to the authority having jurisdiction as suitable for the purpose specified and indicated.

1.06 WARRANTY

A. See Section 017800 - Closeout Submittals, for additional warranty requirements.

B. Provide five year manufacturer limited warranty for three-ply multifilament polyester fabric curtain.

C. Provide lifetime manufacturer limited warranty for counterweights and tension springs.

D. Provide manufacturer's standard 3 year warranty for all component of the door assembly.

E. Extended Warranties:

1. Provide manufacturer's standard 10 year warranty against delamination of skin and foam insulation.

2. Provide manufacturer's standard 20 year finish warranty. Finish warranty to include the following:

a. Protection against crack, peel or check causing separation of the paint from the Product sections (except for slight crazing or cracking as may occur on normal roll-forming or brake bending).

b. Chalk in excess of a numerical rating 8 using the procedures of ASTM D-4214-89 (Method D-659)

c. Fade or change color in excess of 5 E units (Hunter Color Difference) according to ASTM D-2244-85 comparing an unexposed retain sample to the exposed section after removal of dirt and chalk.

PART 2 PRODUCTS

A. Exterior Coiling Doors: Steel slat curtain.

1. Capable of withstanding positive and negative wind loads of 20 psf (940 Pa), without undue deflection or damage to components.

2. Sandwich slat construction with insulated core of polyurethane type insulation.

a. Minimum R Value of Door Assembly to be R=7.7

3. Nominal Slat Size: 2 inches (50 mm) wide x required length.

4. Finish: Factory painted, color as selected.

5. Guides: Angles; galvanized steel.

6. Hood Enclosure: Manufacturer's standard; primed steel.

7. Operation:

a. Electrical operation.

8. Mounting: As indicated.

2.02 MATERIALS

A. Curtain Construction: Interlocking slats.

1. Curtain Bottom: Fitted with angles to provide reinforcement and positive contact in closed position.

2. Weatherstripping: Moisture and rot proof, resilient type, located at jamb edges, bottom of curtain, and where curtain enters hood enclosure of exterior doors.

B. Steel Slats: Minimum 24 gage (0.511 mm) ASTM A653/A653M galvanized steel sheet.

C. Steel Guides: ASTM A36/A36M steel angles, size as required for wind loading, hot-dip galvanized per ASTM A 123/A 123M.

D. Hood Enclosure: Internally reinforced to maintain rigidity and shape.

1. Prime paint.

E. Roller Shaft Counterbalance: Steel pipe and helical steel spring system, capable of producing torque sufficient to ensure smooth operation of curtain from any position and capable of holding position at mid-travel; with adjustable spring tension; requiring 25 lb (10 kg) nominal force to operate.

F. Recycled Content: For Steel Products: Minimum Total Recovered Materials Content - 30%

2.03 ELECTRIC OPERATION

A. Electric Operators:

1. Mounting: Side mounted.

2. Motor Enclosure:

a. Exterior doors: NEMA MG 1 Type 4; open drip proof.

3. Motor Rating: 1/2 hp (375 W); continuous duty.

4. Motor Controller: NEMA ICS 2, full voltage, reversing magnetic motor starter.

5. Controller Enclosure: NEMA 250 Type 1.

6. Opening Speed: 12 inches per second (300 mm/s).

7. Brake: Adjustable friction clutch type, activated by motor controller.

8. Manual override in case of power failure.

9. Refer to division 26 for electrical connections.

B. Control Station: Standard three button (OPEN-STOP-CLOSE) constant pressure control for each operator.

1. Surface mounted.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that opening sizes, tolerances and conditions are acceptable.

3.02 INSTALLATION

A. Install units in accordance with manufacturer's instructions.

B. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.

C. Securely and rigidly brace components suspended from structure.

D. Fit and align assembly including hardware; level and plumb, to provide smooth operation.

E. Coordinate installation of electrical service with Section Division 26.

F. Complete wiring from disconnect to unit components.

G. Coordinate installation of sealants and backing materials at frame perimeter as specified in Section 079005.

H. Install perimeter trim and closures.

3.03 TOLERANCES

A. Maintain dimensional tolerances and alignment with adjacent work.

B. Maximum Variation From Plumb: 1/16 inch (1.5 mm).

C. Maximum Variation From Level: 1/16 inch (1.5 mm).

D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch per 10 ft (3 mm per 3 m) straight edge.

3.04 ADJUSTING

A. Adjust operating assemblies for smooth and noiseless operation.

3.05 CLEANING

A. Clean installed components.

B. Remove labels and visible markings.

END OF SECTION

SECTION 084113 - ALUMINUM-FRAMED ENTRANCES

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes: Swinging Blast Resistant Aluminum-Framed Entrances in Aluminum Curtain Wall Assemblies.

B. Materials included in this section shall meet the requirements for High Performance Sustainable Buildings for New Construction points for the following Sections:

1. 2-6.1.1 - Recycled Content

2. The contractor is expected to understand the HPSB requirements for these sections and include all applicable overhead in their base bid for the necessary documentation to achieve the above listed credits.

C. Related Sections:

1. Section 01 3325 - Project Sustainability Summary

2. Section 01 3329 - Sustainable Design Reporting

3. Section 01 6000 - Product Requirements

4. Section 01 7419 - Construction Waste Management and Disposal

5. Division 08 4413 - Glazed Aluminum Curtain Walls

6. Division 08 7100 - Door Hardware

7. Division 08 8000 - Glazing.

1.02 REFERENCES

A. ASTM International.

1. ASTM F 1642: Standard Method for Glazing and Glazing Systems Subjected to Airblast Loadings.

B. Unified Facilities Criteria (UFC).

1. UFC 1-200-01: General Building Requirements.

2. UFC 3-310-01: Design: Structural Load Data.

3. UFC 4-010-01: DoD Minimum Antiterrorism Standards for Buildings.

1.03 SYSTEM DESCRIPTION

A. General: Aluminum Entrance Systems, including glass and glazing, shims and anchors, accessories and perimeter sealing of entrance framing.

B. Swing Door Performance Requirements:

1. Wind loads: Provide immediate door framing for swing doors, including anchorage, capable of withstanding wind-load design pressures as determined per UFC 3-310-01 Design - Structural Load Data.

2. Air Infiltration: For single acting offset pivot or butt hinged entrances in the closed and locked position, the test specimen shall be tested in accordance with ASTM E 283 at a pressure differential of 6.24 psf (300 Pa) for single doors and 1.567 psf (76 Pa) for pairs of doors. A single 3'0" x 7'0" (915 x 2134) entrance door and frame shall not exceed .50 cfm per square foot. A pair of 6'0" x 7'0" (1830 x 2134) entrance doors and frame shall not exceed 1.0 cfm per square foot. Air leakage for fenestration and doors shall be determined in accordance with NFRC 400. Air leakage shall be determined by a laboratory accredited by a nationally recognized accreditation organization, such as the National Fenestration Rating Council, and shall be labeled and certified by the manufacturer.

3. Structural: Corner strength shall be tested per the Kawneer dual moment load test procedure and certified by an independent testing laboratory to ensure weld compliance and corner integrity [Testing procedure and certified test results available upon request].

4. Overall U-Factor: 0.70 U-factors shall be determined in accordance with NFRC 100. U-Factors shall be determined by a laboratory accredited by a nationally recognized accreditation organization, such as the National Fenestration Rating Council, and shall be labeled and certified by the manufacturer.

5. Overall SHGC: 0.25

6. Overall Visible Transmittance: 40

7. Labeling of Doors and Fenestration: The U-factor, SHGC, and air leakage rate for all manufactured doors and fenestration shall be determined by a laboratory accredited by a nationally recognized accreditation organization, such as the National Fenestration Rating Council. All products shall have a permanent name-plate, installed by the manufacturer, listing the U-factor, SHGC, Visible Transmittance and air leakage rate.

8. UFC 4-010-01 Compliance:

    a. Provide system meeting UFC 4-010-01, Appendix B Best Practices, ASTM F2248 Design Approach for Laminated Glazing Systems.

        1) Level of Protection: Medium

1.04 SUBMITTALS

A. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware,

B. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details.

C. Samples: Submit two samples [4 x 2] inches (102 x 51 mm) in size illustrating finished aluminum surface, glass, [<>] glazing materials.

D. Design Data: Refer to section 08 4413 - provide design and engineering data as required to confirm compliance with standards for overall curtain wall assembly that the door(s) is a part of.

E. Sustainability Submittals, Product data for HPSB Compliance:

1. For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content.

    a. Include statement indicating costs (sell price for each product having recycled content)

    b. Include total weight of products provided

1.05 WARRANTY

A. Manufacturer’s Product Warranty: Submit, for the Government's acceptance, manufacturer’s warranty for entrance system as follows:

1. Warranty Period: Five (5) years from Date of Beneficial Occupancy of the project provided however that the Limited Warranty shall begin in no event later than six months from date of shipment by Kawneer. In addition, welded door corner construction shall be supported with a limited lifetime warranty for the life of the door under normal use.

1.06 QUALITY ASSURANCE

A. Qualifications:

1. Installer Qualifications: Installer experienced to perform work of this section who has specialized in the installation of work similar to that required for this project and who is acceptable to product manufacturer.

2. Manufacturer Qualifications: Manufacturer capable of providing structural calculations, applicable independent product test reports, installation instructions, a review of the application method, customer approval and periodic field service representation during construction.

3. On access control installations, all wiring to be coordinated with a licensed electrical installer.

B. Pre-Installation Meetings: Conduct pre-installation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions, and manufacturer's warranty requirements.

1.07 DELIVERY, STORAGE & HANDLING

A. Ordering: Comply with manufacturer's ordering instructions and lead- time requirements to avoid construction delays.

B. Packing, Shipping, Handling, and Unloading: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

C. Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle entrance doors and components to avoid damage. Protect entrance doors against damage from elements, construction activities, and other hazards before, during and after entrance installation.

1.08 SUSTAINABILITY REQUIREMENTS

A. Contractor shall endeavor to provide materials with a high recycled content:

1. See Part 2 of this specification section for specific recycled content thresholds, if applicable.

PART 2 – PRODUCTS

2.01 BASIS OF DESIGN

A. Single Source Requirements:

1. Provide aluminum framed entrance doors from manufacturer of aluminum curtain wall assembly of which the door is a part of.

2.02 MATERIALS

A. Aluminum (Entrance Door and Components): Alloy and temper recommended by manufacturer for type of use and finish indicated, complying with the requirements of standards indicated below.

   1. Extruded Material Standard: ASTM B 221, 6063-T6 alloy and temper.

B. Steel Reinforcement: Complying with ASTM A 36/ A 36M for structural shapes, plates and bars; ASTM A 611 for cold-rolled sheet and strip or ASTM A 570/ A 570M for hot-rolled sheet and strip.

C. Glazing Gaskets / Setting Blocks: Manufacturer's standard glazing system of black, resilient glazing gaskets, setting blocks, and shims or spacers, fabricated from an elastomer of type and in hardness recommended by system and gasket manufacturer to comply with system performance requirements. Provide Fiberglass Pressure Plates as required to achieve overall thermal performance specified.

D. Fasteners: Where exposed, shall be 300 Series, Stainless Steel.

E. Weather Stripping: Manufacturer's standard replaceable weather stripping as follows:

   1. Meeting stiles on pairs of doors shall be equipped with an adjustable astragal utilizing wool pile with polymeric fin.

   2. The door weathering on a single acting offset pivot or butt hung door and frame (single or pairs) shall be comprised of a thermoplastic elastomer weathering on a tubular shape with a semi-rigid polymeric backing.

   3. Bottom Rail Sweep Strips shall be EPDM blade type gaskets in an aluminum extrusion.

F. Recycled Content: For aluminum products: Minimum Total Recovered Materials Content - 30%

2.03 HARDWARE

A. General: Provide heavy-duty hardware units indicated in sizes, number, and type recommended by manufacturer for entrances indicated. Finish exposed parts to match door finish, unless otherwise indicated.

B. Thresholds: At exterior doors, provide manufacturer's standard threshold with cutouts coordinated for operating hardware, with anchors and jamb clips, and not more than 1/2-inch- (12.7mm) high, with beveled edges providing a floor level change with a slope of not more than 1:2, and in the following material. Provide threshold width as

required per project conditions.

C. For each door, include weatherstripping and sill sweep strip.

D. Provide all other hardware for fully operational door, refer to section 08 7100 for list of hardware being provided by others.

2.04 ACCESSORIES

A. Spacers, Setting Blocks, Gaskets, and Bond Breakers: Manufacturer's standard permanent, non-migrating types in hardness recommended by manufacturer, compatible with sealants, and suitable for system performance requirements.

B. Framing system gaskets, sealants, and joint fillers as recommended by manufacturer for joint type.

C. Sealants and joint fillers for joints at perimeter of entrance system as specified in Section 07 9005 - Joint Sealers.

D. Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.

2.05 RELATED MATERIALS

A. Sealants: Refer to 07 9005 - Joint Sealers.

B. Glass: Refer to 08 8000 - Glazing.

C. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements, except containing no asbestos, formulated for 30-mil (0.762-mm) thickness per coat.

2.06 COMPONENTS

A. Doors: Provide manufacturer's 2” (51 mm) thick glazed doors with nominal 0.188" (5 mm) thick, extruded tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deep penetration and fillet welded.

1. Glazing Stops and Gaskets: Provide manufacturer's standard snap-on and screw applied extruded-aluminum glazing stops and preformed gaskets for glazed infill thickness specified.

2. Stile Design:

a. 5” Vertical Stile, 5” Top Rail, 10” (166) Bottom Rail.

B. Brackets and Reinforcements: Provide manufacturer's standard brackets and reinforcements that are compatible with adjacent materials. Provide non-staining, nonferrous shims for aligning system components.

C. Provide manufacturer's standard adjustable glass jacks for door alignment.

2.07 FABRICATION

A. General: Fabricate components per manufacturer's installation instructions. When assembled, components will have accurately fitted joints to produce hairline joints.

1. Door corner construction shall consist of mechanical clip fastening, SIGMA deep penetration plug welds and 1-1/8" (29) long fillet welds inside and outside of all four corners.

2. Prepare components with internal reinforcement to receive door hardware.

3. Factory assemble door and frame units and factory install hardware to greatest extent possible.

4. Fabrication Tolerances: Fabricate aluminum entrances in accordance with entrance manufacturer's prescribed tolerances.

2.08 FINISHES

A. Factory Finishing:

1. Refer to section 08 4413- Glazed Aluminum Curtain Walls. Door finish to match custom curtain wall factory finish.

2.09 SOURCE QUALITY CONTROL

A. Source Quality: Provide aluminum entrances specified herein from a single source.

1. Building Enclosure System: When aluminum entrances are part of a building enclosure system, including storefront framing, windows, curtain wall system and related products, provide building enclosure system products from a single source manufacturer.

B. Fabrication Tolerances: Fabricate aluminum entrances in accordance with entrance manufacturer's prescribed tolerances.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Site Verification of Conditions: Verify substrate conditions (which have been previously installed under other sections) are acceptable for product installation in accordance with manufacturer's instructions. Verify openings are sized to receive storefront system and sill plate is level in accordance with manufacturer's acceptable tolerances.

1. Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements, fabrication schedule with construction progress to avoid construction delays.

3.02 INSTALLATION

A. General: Install entrance system in accordance with manufacturer's instructions and AAMA storefront and entrance guide specifications manual.

1. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

2. Provide alignment attachments and shims to permanently fasten system to building structure.

3. Align assembly plumb and level, free of warp and twist. Maintain assembly dimensional tolerances aligning with adjacent work.

4. Set thresholds in bed of mastic and secure.

5. Adjusting: Adjust operating hardware for smooth operation.

B. Related Products Installation Requirements:

1. Sealants (Perimeter): Refer to 07 9005 - Joint Sealers.

2. Glass: Refer 08 8000 – Glazing.

a. Reference: ANSI Z97.1, CPSC 16 CFR 1201 and GANA Glazing Manual.

3.03 CLEANING & PROTECTION

A. Cleaning: Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions prior to Government's acceptance. Remove construction

debris from project site and legally dispose of debris.

B. Protection: Protect installed product's finish surfaces from damage during construction. Protect aluminum entrances from damage from grinding and polishing compounds, plaster, lime, acid, cement, or other harmful contaminants. Remove and replace damaged aluminum entrances at no extra cost.

END OF SECTION

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SECTION 084413 - GLAZED ALUMINUM CURTAIN WALLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Architectural Aluminum Curtain Wall Systems, including perimeter trims, stools, accessories, shims and anchors, and perimeter seating of curtain wall framing.

B. System depth: as required to meet UFC 4-010-01, Appendix B, ASTM F2248 Design Approach for Laminated Glass Glazing System.

C. Materials included in this section shall meet the requirements for High Performance Sustainable Buildings for New Construction points for the following Sections:

1. 2-6.1.1 - Recycled Content

2. The contractor is expected to understand the HPSB requirements for these sections and include all applicable overhead in their base bid for the necessary documentation to achieve the above listed credits.

1.02 RELATED REQUIREMENTS

A. Section 01 3325 - Project Sustainability Summary

B. Section 01 3329 - Sustainable Design Reporting

C. Section 01 6000 - Product Requirements

D. Section 01 7419 - Construction Waste Management and Disposal

E. Section 033000 - Cast-in-Place Concrete: Weld plates embedded in concrete for attachment of anchors.

F. Section 051200 - Structural Steel Framing: Steel attachment members.

G. Section 055000 - Metal Fabrications: Steel attachment devices.

H. Section 07 9005 - Joint Sealers: Perimeter sealant and back-up materials.

I. Section 08 4113 - Aluminum-Framed Entrances

J. Section 088000 - Glazing.

1.03 REFERENCE STANDARDS

A. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site 2015.

B. AAMA 501.1 - Standard Test Method for Water Penetration of Windows, Curtain Walls and Doors Using Dynamic Pressure 2017.

C. AAMA 501.2 - Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems 2015.

D. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections 2009.

E. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2022.

F. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures Most Recent Edition Cited by Referring Code or Reference Standard.

G. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.

H. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.

I. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate 2014.

J. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes 2021.

K. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric) 2021.

L. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen 2004 (Reapproved 2012).

M. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference 2014 (Reapproved 2021).

N. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference 2000

(Reapproved 2023).

O. ASTM E547 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference 2000 (Reapproved 2016).

P. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference 2015 (Reapproved 2023).

Q. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic) 2019.

R. Unified Facilities Criteria (UFC):

1. UFC 1-200-01: General Building Requirements.

2. UFC 3-310-01: Design: Structural Load Data.

3. UFC 4-010-01: DoD Minimum Antiterrorism Standards for Buildings.

S. Protective Design Center Technical Report (PDC-TR) 19 April 2012.

1.04 SUBMITTALS

A. See Section 01 3001 - Submittals

B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, internal drainage details, glazing, and infill.

C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required.

D. Samples: Submit two samples in size illustrating finished aluminum surface, glazing, infill panels, and glazing materials.

E. Test Reports: Submit results of full-size mock-up testing. Reports of tests previously performed on the same design are acceptable.

F. Design Data: Provide framing member structural and physical characteristics and engineering calculations, and identify dimensional limitations; include load calculations at points of attachment to building structure.

G. Structural Glazing Adhesive: Submit product data and calculations showing compliance with performance requirements.

H. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.

I. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.

J. Warranty: Submit manufacturer warranty and ensure forms have been completed in the Owner's name and registered with manufacturer.

K. Sustainability Submittals, Product data for HPSB Compliance:

1. For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content.

a. Include statement indicating costs (sell price for each product having recycled content)

b. Include total weight of products provided

1.05 QUALITY ASSURANCE

A. Designer Qualifications: Design curtain wall and its structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the State in which the Project is located.

B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with not less than three years of documented experience.

1.06 MOCK-UP

A. See Section 014000 - Quality Requirements, for general requirements for mock-ups.

B. Provide mock-up of one curtain wall unit including all Components, sealants, flashings, glazing, attachments, and anchorage.

C. Locate on-site where directed by the Government; mock-up may remain as part of the Work.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Handle products of this section in accordance with AAMA CW-10.

B. Protect finished aluminum surfaces with strippable coating. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.08 FIELD CONDITIONS

A. Do not install sealants when ambient temperature is less than 40 degrees F (5 degrees C). Maintain this minimum temperature during and 48 hours after installation.

1.09 WARRANTY

A. See Section 017800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a 10 year period after Date of Beneficial Occupancy.

C. Provide 10 year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.

D. Provide 20 year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

1.10 SUSTAINABILITY REQUIREMENTS

A. Contractor shall endeavor to provide materials with a high recycled content:

1. See Part 2 of this specification section for specific recycled content thresholds, if applicable.

PART 2 PRODUCTS

2.01 CURTAIN WALL

A. Aluminum-Framed Curtain Wall: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.

1. Outside glazed, with pressure plate (fiberglass if necessary to achieve overall thermal performance specified) and mullion cover.

2. Vertical Mullion Face Width: 2-1/2 inches (63.5 mm).

3. Vertical Mullion Depth From Face to Back: As required to meet blast resistance requirements. Drawings indicate 7-1/2" depth. Advise the Government for coordination if required mullion depth exceed 7-1/2 inches.

4. Finish: High performance organic coating -

a. Factory finish surfaces that will be exposed in completed assemblies.

b. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.

c. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.

d. See part 2.05 for additional requirements.

5. Provide flush joints and corners, weathersealed, accurately fitted and secured; prepared to receive anchors; fasteners and attachments concealed from view; reinforced as required for imposed loads.

6. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.

7. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.

8. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.

B. Structural Performance Requirements: Design and size components to withstand the following load requirements without damage or permanent set.

1. Design Wind Loads: Comply with the requirements of IBC 2018 code.

a. Measure performance by testing in accordance with ASTM E330/E330M, using test loads equal to 1.5 times the design wind loads and 10 second duration of maximum pressure.

b. Member Deflection: For spans less than 13 feet 6 inches (4115 mm), limit member deflection to flexure limit of glass in any direction, and maximum of 1/175 of span or 3/4 inch (19 mm), whichever is less and with full recovery of glazing materials.

c. Member Deflection: For spans over 13 feet 6 inches (4115 mm) and less than 40 feet (12.2 m), limit member deflection to flexure limit of glass in any direction, and maximum of 1/240 of span plus 1/4 inch (1/240 of span plus 6.4 mm), with full recovery of glazing materials.

2. Seismic Loads: Design and size components to withstand seismic loads and sway displacement in accordance with requirements of ASCE 7.

3. Movement: Accommodate the following movement without damage to components or deterioration of seals:

   a. Expansion and contraction caused by 180 degrees F (82 degrees C) surface temperature.

   b. Expansion and contraction caused by cycling temperature range of 170 degrees F (77 degrees C) over a 12 hour period.

   c. Movement of curtain wall relative to perimeter framing.

   d. Deflection of structural support framing, under permanent and dynamic loads.

C. Water Penetration Resistance on Manufactured Assembly: No uncontrolled water on indoor face when tested as follows:

D. Water Penetration Resistance on Manufactured Assembly: No uncontrolled water on indoor face when tested as follows:

1. Test Pressure Differential: 10 psf (480 Pa).

2. Test Method: ASTM E331.

E. Air Leakage: Maximum of 0.06 cu ft/min/sq ft (0.3 L/s/sq m) of wall area, when tested in accordance with ASTM E283 at 6.27 psf (300 Pa) pressure differential across assembly.

1. Air leakage for fenestration and doors shall be determined in accordance with NFRCX 400. Air leakage shall be determined by a laboratory accredited by a nationally recognized accreditation organization, such as the National Fenestration Rating Council, and shall be labeled and certified by the manufacturer.

F. Thermal Performance Requirements:

1. Overall U-value Including Glazing: [.50] Btu/(hr sq ft deg F) maximum.

2. U-value shall be determined in accordance with NFRC 100. U-Factors shall be determined by a laboratory accredited by a nationally recognized accreditation organization, such as the National Fenestration Rating Council, and shall be labeled and certified by the manufacturer.

3. Overall Solar Heat Gain Coefficient Including Glazing: .25

G. Optical Performance Requirements:

1. Overall Visible Transmittance: .40

H. Labeling of Fenestration: The U-factor, SHGC, and air leakage rate for all manufactured doors and fenestration shall be determined by a laboratory accredited by a nationally recognized accreditation organization, such as the National Fenestration Rating Council. All products shall have a permanent name-plate, installed by the manufacturer, listing the U-factor, SHGC, Visible Transmittance and air leakage rate.

I. UFC 4-010-01 Compliance:

1. Provide system meeting UFC4-010-01, Appendix B Best Practices, ASTM F2248 Design Approach for Laminated Glazing Systems.

a. Level of Protection: Low/Medium

1) Provide medium level of protection at assemblies containing door opening 150.

2) Provide low level of protection at all other assemblies not scheduled to receive medium level of protection above.

2.02 COMPONENTS

A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.

1. Structurally Reinforced Members: Extruded aluminum with internal reinforcement of structural steel member.

B. Glazing: As specified in Section 088000.

2.03 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M).

B. Structural Steel Sections: ASTM A36/A36M; galvanized in accordance with requirements of ASTM A123/A123M.

C. Structural Supporting Anchors Attached to Reinforced Concrete Members: Design for welded attachment to weld plates embedded in concrete.

D. Fasteners: Stainless steel; type as required or recommended by curtain wall manufacturer.

E. Exposed Flashings: 0.040 inch (1 mm) thick aluminum sheet; finish to match framing members. Provide separation material between all adjacent dissimilar metals.

F. Concealed Flashings: 0.018 inch (0.5 mm) thick galvanized steel and aluminum.

G. Perimeter Sealant: Type II specified in Section 079005.

H. Glazing: As specified in Section 08 8000.

I. Glazing Accessories: As specified in Section 088000.

J. Touch-Up Primer for Galvanized Steel Surfaces: SSPC-Paint 20, zinc rich.

K. Recycled Content: For aluminum products: Minimum Total Recovered Materials Content - 30%

2.04 FINISHES

A. Superior Performing Organic Coatings: AAMA 2605 multiple coat, thermally cured polyvinylidene fluoride (PVDF) multi-coat thermoplastic fluorpolymer coating system, including minimum 70 percent PVDF color topcoat and minimum total dry film thickness of 1.2 mil ; color and gloss as selected from manufacturer's standard line.

B. Color: As selected by the Contracting Officer from the manufacturer's full range of available colors.

C. Touch-Up Materials: As recommended by coating manufacturer for field application.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify dimensions, tolerances, and method of attachment with other related work.

B. Verify that curtain wall openings and adjoining air and vapor seal materials are ready to receive work of this section.

C. Verify that anchorage devices have been properly installed and located.

3.02 INSTALLATION

A. Install curtain wall system in accordance with manufacturer's instructions.

B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

C. Provide alignment attachments and shims to permanently fasten system to building structure.

D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.

E. Provide thermal isolation where components penetrate or disrupt building insulation.

F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.

G. Coordinate attachment and seal of perimeter air and vapor barrier materials.

H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

I. Structural Sealant Glazing (SSG) Adhesive: Install structural sealant glazing adhesive and weatherseal sealant in accordance with manufacturer's instructions.

J. Install perimeter sealant in accordance with Section 079005.

K. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES

A. Maximum Variation from Plumb: 0.06 inches every 3 ft (1.5 mm/m) non-cumulative or 0.5 inches per 100 ft (12 mm/30 m), whichever is less.

B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch (0.8 mm).

C. Sealant Space Between Curtain Wall Mullions and Adjacent Construction: Maximum of 3/4 inch (19 mm) and minimum of 1/4 inch (6 mm).

3.04 FIELD QUALITY CONTROL

A. Provide services of curtain wall manufacturer's field representative to observe for proper installation of system and submit report.

B. Water-Spray Test: Provide water spray quality test of installed curtain wall components in accordance with AAMA 501.2 during construction process and before installation of interior finishes.

1. Test a minimum of 25% of the total opening area included within the scope of the project. Also, test a minimum of one opening in each of the discrete wall assemblies present within the project. For the purposes of this testing, a discrete wall assembly refers to a wall containing the same finished cladding and backup

wall construction type.

2. Repair any instances that fail the test and provide retesting of the corrected assembly at no additional cost to the Government.

3. If more than one instance of failure within a particular wall assembly is identified, the Contractor shall re-test all openings within similar wall assemblies at no additional cost to the Government.

4. Conduct tests in each area prior to 10 percent and 50 percent completion of this work.

C. Repair or replace curtain wall components that have failed designated field testing, and retest to verify performance complies with specified requirements.

3.05 CLEANING

A. Remove protective material from pre-finished aluminum surfaces.

B. Remove excess sealant by method acceptable to sealant manufacturer.

3.06 PROTECTION

A. Protect installed products from damage until Date of Beneficial Occupancy.

END OF SECTION

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SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Government's Solicitation Documents and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes commercial door hardware for the following:

1. Swinging doors.
2. Other doors to the extent indicated.

B. Door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.
2. Cylinders specified for doors in other sections.

C. Related Sections:

1. Division 06 Section "Rough Carpentry".
2. Division 08 Section "Hollow Metal Doors and Frames".
3. Division 08 Section "Aluminum-Framed Entrances and Storefronts".

D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. ICC/IBC - International Building Code.
3. NFPA 70 - National Electrical Code.
4. NFPA 80 - Fire Doors and Windows.
5. NFPA 101 - Life Safety Code.
6. NFPA 105 - Installation of Smoke Door Assemblies.
7. State Building Codes, Local Amendments.

E. Standards: All hardware specified herein shall comply with the following industry standards as applicable. Any undated reference to a standard shall be interpreted as referring to the latest edition of that standard:

1. ANSI/BHMA Certified Product Standards - A156 Series.

2. UL10C - Positive Pressure Fire Tests of Door Assemblies.
3. ANSI/UL 294 - Access Control System Units.
4. UL 305 - Panic Hardware.
5. ANSI/UL 437- Key Locks.

1.3 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."

2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.

3. Content: Include the following information:

a. Type, style, function, size, label, hand, and finish of each door hardware item.

b. Manufacturer of each item.

c. Fastenings and other pertinent information.

d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.

e. Explanation of abbreviations, symbols, and codes contained in schedule.

f. Mounting locations for door hardware.

g. Door and frame sizes and materials.

h. Warranty information for each product.

4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

C. Keying Schedule: After a keying meeting with the Contracting Officer has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. The Government must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

D. Informational Submittals:

1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

E. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.

1.4 QUALITY ASSURANCE

A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

B. Certified Products: Where specified, products must maintain a current listing in the Builders Hardware Manufacturers Association (BHMA) Certified Products Directory (CPD).

C. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

D. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by

the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor and the Government concerning door hardware and keying.

E. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.

F. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.

G. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:

1. Function of building, purpose of each area and degree of security required.
2. Plans for existing and future key system expansion.
3. Requirements for key control storage and software.
4. Installation of permanent keys, cylinder cores and software.
5. Address and requirements for delivery of keys.

H. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.

1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
3. Review and finalize construction schedule and verify availability of materials.
4. Review the required inspecting, testing, commissioning, and demonstration procedures

I. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to the Government via registered mail or overnight package service. Instructions for delivery to the Government shall be established at the "Keying Conference".

1.6 COORDINATION

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

B. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.7 WARRANTY

A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive the Government of other rights the Government may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Government. Failures include, but are not limited to, the following:

1. Structural failures including excessive deflection, cracking, or breakage.
2. Faulty operation of the hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal

weathering.
4. Electrical component defects and failures within the systems operation.

C. Standard Warranty Period: One year from date of Beneficial Occupancy, unless otherwise indicated.

D. Special Warranty Periods:

1. Ten years for mortise locks and latches.
2. Five years for exit hardware.
3. Twenty five years for manual overhead door closer bodies.
4. Two years for electromechanical door hardware, unless noted otherwise.

1.8 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for the Government's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.

B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3.

C. Substitutions: Requests for substitution and product approval in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the Contracting Officer and their designated representatives.

2.2 HANGING DEVICES

A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.

1. Quantity: Provide the following hinge quantity:

a. Two Hinges: For doors with heights up to 60 inches.

b. Three Hinges: For doors with heights 61 to 90 inches.

c. Four Hinges: For doors with heights 91 to 120 inches.

d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.

2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:

a. Widths up to 3’0”: 4-1/2” standard or heavy weight as specified.

b. Sizes from 3’1” to 4’0”: 5” standard or heavy weight as specified.

3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:

a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.

b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.

4. Hinge Options: Comply with the following:

a. Non-removable Pins: With the exception of electric through wire hinges, provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.

2.3 DOOR OPERATING TRIM

A. Flush Bolts and Surface Bolts: ANSI/BHMA A156.3 and A156.16, Grade 1, certified.

1. Flush bolts to be furnished with top rod of sufficient length to allow bolt retraction device location approximately six feet from the floor.
2. Furnish dust proof strikes for bottom bolts.
3. Surface bolts to be minimum 8” in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable.
4. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.

B. Door Push Plates and Pulls: ANSI/BHMA A156.6 certified door pushes and pulls of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.

1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
4. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.

2.4 CYLINDERS AND KEYING

A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.

B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.
1. Acceptable Manufacturers:

a. Stanley Best (BE). Provide cylinders and keying system matching existing base standard. No substitutions allowed.

b. Ensure all other hardware items are compatible with and capable of receiving required Stanley Best cylinder/core system

C. Cylinder Types: Original manufacturer cylinders able to supply the following cylinder formats and types:

1. Threaded mortise cylinders with rings and cams to suit hardware application.
2. Rim cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
3. Bored or cylindrical lock cylinders with tailpieces as required to suit locks.
4. Tubular deadlocks and other auxiliary locks.
5. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
6. Keyway: Match Facility Restricted Keyway.

D. Interchangeable Cores: Provide small format interchangeable cores as specified, core insert, removable by use of a special key; usable with other manufacturers' cylinders.

E. Keying System: Each type of lock and cylinders to be factory keyed.

1. Supplier shall conduct a "Keying Conference" to define and document keying system instructions and requirements.
2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by the Government.
3. Existing System: Field verify and key cylinders to match the Government's existing system.

F. Key Quantity: Provide the following minimum number of keys:

1. Change Keys per Cylinder: Two (2)
2. Master Keys (per Master Key Level/Group): Five (5).
3. Construction Keys (where required): Ten (10).

G. Construction Keying: Provide construction master keyed cylinders.

H. Key Registration List (Bitting List):

1. Provide keying transcript list to Contracting Officer representative in the proper format for importing into key control software.
2. Provide transcript list in writing or electronic file as directed by the Contracting Officer.

2.5 MECHANICAL LOCKS AND LATCHING DEVICES

A. Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 Certified Products Directory (CPD) listed. Locksets are to be manufactured with a corrosion resistant steel case and be field-reversible for handing without disassembly of the lock body.

1. Where specified, provide status indicators with highly reflective color and wording for "locked/unlocked" or "vacant/occupied" with custom wording options if required. Indicator to be located above the cylinder with the inside thumb-turn not blocking the visibility of the indicator status. Indicator window size to be a minimum of 2.1" x 0.6" with a curved design allowing a 180 degree viewing angle with protective covering to prevent tampering.

2. Ensure all other hardware items are compatible with and capable of receiving required Stanley Best cylinder/core system

2.6 LOCK AND LATCH STRIKES

A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.

B. Standards: Comply with the following:

1. Strikes for Mortise Locks and Latches: BHMA A156.13.
2. Strikes for Bored Locks and Latches: BHMA A156.2.
3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
4. Dustproof Strikes: BHMA A156.16.

2.7 CONVENTIONAL EXIT DEVICES

A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:

1. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.

2. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer’s catalog and template book for specific requirements.

3. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.

4. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.

5. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.

   a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.

   b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.

6. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.

7. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2” wide stiles.

8. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.

9. Rail Sizing: Provide exit device rails factory sized for proper door width application.

10. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.

B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Exit device latch to be stainless steel, pullman type, with deadlock feature.

2.8 DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers.

2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.

3. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated

frequency of use. Where closers are indicated for doors required to be accessible to the Americans with Disabilities Act, provide units complying with ANSI ICC/A117.1.

4. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.

5. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.

6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Commercial Duty): ANSI/BHMA 156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted, institutional grade door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck, closing sweep, and latch speed control valves. Provide non-handed units standard.

2.9 ARCHITECTURAL TRIM

A. Door Protective Trim

1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.

2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1” LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.

3. Where plates are applied to fire rated doors with the top of the plate more than 16” above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer’s catalog and template book for specific requirements for size and applications.

4. Protection Plates: ANSI/BHMA A156.6 certified protection plates (kick, armor, or mop), fabricated from the following:

a. Stainless Steel: 300 grade, 050-inch thick.

5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.

2.10 DOOR STOPS AND HOLDERS

A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.

B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.

2.11 ARCHITECTURAL SEALS

A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.

1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.

C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.

1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NPFA 252, Standard Methods of Fire Tests of Door Assemblies.

D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.

E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

2.12 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.13 FINISHES

A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware

C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Notify the Contracting Officer of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.

3.3 INSTALLATION

A. Install each item of mechanical and electromechanical hardware and access control

equipment to comply with manufacturer's written instructions and according to specifications.

1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.

B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:

1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
2. DHI TDH-007-20: Installation Guide for Doors and Hardware.
3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

A. Field Inspection (Punch Report): Reference Division 01 Sections “Closeout Procedures”. Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted. Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.

1. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.

3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

B. Clean adjacent surfaces soiled by door hardware installation.

C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Government occupancy.

3.7 DEMONSTRATION

A. Instruct Government maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

A. The hardware sets represent the design intent and direction of the Contracting Officer. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the Contracting Officer with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

1. Quantities listed are for each pair of doors, or for each single door.

2. The supplier is responsible for handing and sizing all products.

3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.

4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.

Hardware Sets

Set: 1.0

Doors: 150
Description: EXT LOBBY PR - ALUM

2	Continuous Hinge	KCFMXX-HD1		PE
1	Exit Device (CVR, classroom)	7220 503F	630	YA
1	Exit Device (CVR, exit only)	7220 EO	630	YA
1	Cylinder - core	SFIC as required	626	BE
2	Door Pull	BF162	US32D	RO
2	Surface Closer	CLP8501 TBGN	690	NO
1	Threshold	271A		PE
1	Gasketing	by door / frame mfg		

Set: 2.0

Doors: 151, 152
Description: EXT WORK / BREAK - ALUM

1	Continuous Hinge	KCFMXX-HD1		PE
1	Rim Exit Device, Classroom	7200 503F	630	YA
1	Cylinder - core	SFIC as required	626	BE
2	Door Pull	BF162	US32D	RO
1	Surface Closer	CLP8501 TBGN	689	NO
1	Threshold	271A		PE
1	Gasketing	by door / frame mfg		

Set: 3.0

Doors: 170
Description: EXT X-RAY - PR

10	Hinge (heavy weight)	T4A3386 NRP 4-1/2" x 4-1/2"	US32D	MK
1	Mullion	KRM200	600	YA
1	Rim Exit Device, Exit Only	7100 EO	630	YA
1	Exit Device (rim, nightlatch)	7100 JN627F SN-134	630	YA
1	Cylinder - core	SFIC as required	626	BE
2	Surface Closer	CLP8501 TBGN	690	NO
2	Armor Plate	K1050 36" X 2" LDW 4BE CSK	US32D	RO
1	Threshold	271A		PE
1	Gasketing	S88D		PE
1	Rain Guard	346C x LAR		PE
2	Sweep	315CN		PE
1	Astragal [Set]	29324CNB		PE
1	Astragal	S772D [mtg on mull]		PE

NOTE: EXISTING FRAME INTENDED TO REMAIN. FIELD VERIFY EXISTING CONDITIONS AND ENSURE NEW HARDWARE IS COMPATIBLE WITH EXISTING FRAME. REINFORCE EXISTING FRAME AS REQ.

Set: 4.0

Doors: 156, 159, 164, 166, 168, 169, 171
Description: EXT SHOP / BAY

3	Hinge (heavy weight)	T4A3386 NRP 4-1/2" x 4-1/2"	US32D	MK
1	Exit Device (rim, nightlatch)	7100 JN627F SN-134	630	YA
1	Cylinder - core	SFIC as required	626	BE
1	Surface Closer	CLP8501 TBGN	690	NO
1	Kick Plate	K1050 10" X 2" LDW 4BE CSK	US32D	RO
1	Threshold	271A		PE
1	Gasketing	S88D		PE
1	Rain Guard	346C x LAR		PE
1	Sweep	315CN		PE

NOTE: EXISTING FRAME INTENDED TO REMAIN @ OPENINGS 159, 164, AND 169. FIELD VERIFY EXISTING CONDITIONS AND ENSURE NEW HARDWARE IS COMPATIBLE WITH EXISTING FRAME. REINFORCE EXISTING FRAME AS REQ.

Set: 5.0

Doors: 173
Description: EXT ELEC

3	Hinge (heavy weight)	T4A3386 NRP 4-1/2" x 4-1/2"	US32D	MK
1	Exit Device (rim, nightlatch)	7100 JN627F SN-134	630	YA
1	Cylinder - core	SFIC as required	626	BE
1	Surface Closer	CLP8501 TBGN	689	NO
1	Threshold	271A		PE
1	Gasketing	S88D		PE
1	Rain Guard	346C x LAR		PE
1	Sweep	315CN		PE

Set: 6.0

Doors: 157, 158, 161, 163, 165
Description: EXT MEP - PR

6	Hinge, Full Mortise	TA2314 NRP 4-1/2" x 4-1/2"	US32D	MK
2	Flush Bolt	555	US26D	RO
1	Dust Proof Strike	570	US26D	RO
1	Mortise Lock (storeroom)	JNR 8805FL A620	626	YA
1	Cylinder - core	SFIC as required	626	BE
1	Surface Closer	CLP8501 TBGN	689	NO
2	Kick Plate	K1050 10" X 2" LDW 4BE CSK	US32D	RO
1	Threshold	271A		PE
1	Gasketing	S88D		PE
1	Rain Guard	346C x LAR		PE
1	Sweep	315CN		PE
1	Astragal	357SP X S88D		PE

NOTE: EXISTING FRAME INTENDED TO REMAIN @ OPENING 165. FIELD VERIFY EXISTING CONDITIONS AND ENSURE NEW HARDWARE IS COMPATIBLE WITH EXISTING FRAME. REINFORCE EXISTING FRAME AS REQ.

Set: 7.0

Doors: 153, 154
Description: EXT MEP

3	Hinge, Full Mortise	TA2314 NRP 4-1/2" x 4-1/2"	US32D	MK
1	Mortise Lock (storeroom)	JNR 8805FL A620	626	YA
1	Cylinder - core	SFIC as required	626	BE
1	Surface Closer	CLP8501 TBGN	689	NO
1	Kick Plate	K1050 10" X 2" LDW 4BE CSK	US32D	RO
1	Threshold	271A		PE
1	Gasketing	S88D		PE
1	Rain Guard	346C x LAR		PE
1	Sweep	315CN		PE

Set: 8.0

Doors: 130a, 130b
Description: TOOL CRIB - PR

6	Hinge, Full Mortise, Hvy Wt	T4A3786 NRP 4-1/2" x 4-1/2"	US26D	MK
2	Flush Bolt	555	US26D	RO
1	Dust Proof Strike	570	US26D	RO
1	Mortise Lock (storeroom)	JNR 8805FL A620	626	YA
1	Cylinder - core	SFIC as required	626	BE
2	Surface Closer / Holder	CLP8501R TBGN	689	NO
2	Armor Plate	K1050 36" X 2" LDW 4BE CSK	US32D	RO
1	Astragal	357SP X S88D		PE
2	Silencer	608		RO

Set: 9.0

Doors: 131
Description: HAZMAT PR

6	Hinge (heavy weight)	T4A3786 4-1/2" x 4-1/2"	US26D	MK
2	Flush Bolt	555	US26D	RO
1	Dust Proof Strike	570	US26D	RO
1	Mortise Lock (storeroom)	JNR 8805FL A620	626	YA
2	Surface Closer	CLP8501 TBGN	689	NO
2	Armor Plate	K1050 36" X 2" LDW 4BE CSK	US32D	RO
1	Threshold	271A		PE
1	Gasketing	S88D		PE
2	Sweep	315CN		PE
1	Astragal	357SP X S88D		PE

Set: 10.0

Doors: 125
Description: DARKROOM / MAN TRAP

3	Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1	Passage Latch	JNR 8801FL	626	YA
1	Cylinder - core	SFIC as required	626	BE
1	Surface Closer	8501 TBGN	689	NO
1	Kick Plate	K1050 10" X 2" LDW 4BE CSK	US32D	RO
1	Door Stop	409 / 446	US32D	RO
1	Threshold	271A		PE
1	Gasketing	322CSPK		PE
1	Door Bottom	STC411APK		PE

NOTE: EXISTING FRAME INTENDED TO REMAIN. FIELD VERIFY EXISTING CONDITIONS AND ENSURE NEW HARDWARE IS COMPATIBLE WITH EXISTING FRAME. REINFORCE EXISTING FRAME AS REQ.

Set: 11.0

Doors: 102, 107, 123, 124
Description: SHOP ENTRY

3	Hinge (heavy weight)	T4A3786 4-1/2" x 4-1/2"	US26D	MK
1	Mortise Lock (classroom)	JNR 8808FL A620	626	YA
1	Cylinder - core	SFIC as required	626	BE
1	Surface Closer	8501 TBGN	689	NO
1	Kick Plate	K1050 10" X 2" LDW 4BE CSK	US32D	RO
1	Door Stop	409 / 446	US32D	RO
1	Threshold	271A		PE
1	Gasketing	S88D		PE
1	Sweep	315CN		PE

NOTE: EXISTING FRAME INTENDED TO REMAIN @ OPENINGS 123 AND 124. FIELD VERIFY EXISTING CONDITIONS AND ENSURE NEW HARDWARE IS COMPATIBLE WITH EXISTING FRAME. REINFORCE EXISTING FRAME AS REQ.

Set: 12.0

Doors: 101a, 101b
Description: LOBBY

3	Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1	Rim Exit Device, Classroom	7100 JN626F	630	YA
1	Cylinder - core	SFIC as required	626	BE
1	Surface Closer	8501 TBGN	689	NO
1	Kick Plate	K1050 10" X 2" LDW 4BE CSK	US32D	RO
1	Door Stop	409 / 446	US32D	RO
1	Gasketing	by door / frame mfg		

NOTE: EXISTING FRAME INTENDED TO REMAIN @ OPENING 101B. FIELD VERIFY EXISTING CONDITIONS AND ENSURE NEW HARDWARE IS COMPATIBLE WITH EXISTING FRAME. REINFORCE EXISTING FRAME AS REQ.

Set: 12.1

Doors: 118, 134
Description: EGRESS - RATED

3	Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1	Fire Rated Rim Exit, Classroom	7100F JN626F A620	630	YA
1	Cylinder - core	SFIC as required	626	BE
1	Surface Closer	8501 TBGN	689	NO
1	Kick Plate	K1050 10" X 2" LDW 4BE CSK	US32D	RO
1	Door Stop	409 / 446	US32D	RO
1	Gasketing	S88D		PE

NOTE: EXISTING FRAME INTENDED TO REMAIN @ OPENING 118. FIELD VERIFY EXISTING CONDITIONS AND ENSURE NEW HARDWARE IS COMPATIBLE WITH EXISTING FRAME. REINFORCE EXISTING FRAME AS REQ.

Set: 13.0

Doors: 126
Description: CONTROL

3	Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1	Mortise Lock (classroom)	JNR 8808FL A620	626	YA
1	Cylinder - core	SFIC as required	626	BE
1	Surface Closer	CLP8501 TBGN	689	NO
1	Kick Plate	K1050 10" X 2" LDW 4BE CSK	US32D	RO
1	Threshold	271A		PE
1	Gasketing	S88D		PE

NOTE: EXISTING FRAME INTENDED TO REMAIN. FIELD VERIFY EXISTING CONDITIONS AND ENSURE NEW HARDWARE IS COMPATIBLE WITH EXISTING FRAME. REINFORCE EXISTING FRAME AS REQ.

Set: 14.0

Doors: 110a, 110b, 111a, 111b, 114a, 114b, 115
Description: OFFICE / ADMIN

3	Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1	Mortise Lock (entry)	JNR 8807FL A620	626	YA
1	Cylinder - core	SFIC as required	626	BE
1	Surface Closer	8501 TBGN	689	NO
1	Kick Plate	K1050 10" X 2" LDW 4BE CSK	US32D	RO
1	Door Stop	409 / 446	US32D	RO
3	Silencer	608		RO

NOTE: EXISTING FRAME INTENDED TO REMAIN @ DOORS 110B AND 114A. FIELD VERIFY EXISTING CONDITIONS AND ENSURE NEW HARDWARE IS COMPATIBLE WITH EXISTING FRAME. REINFORCE EXISTING FRAME AS REQ.

PROVIDE GASKETING AT OPENINGS 110, 111B, AND 114A AS REQUIRED FOR SMOKE PARTITIONS.

Set: 15.0

Doors: 133
Description: BAY OFFICE

3	Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1	Mortise Lock (entry)	JNR 8807FL A620	626	YA
1	Cylinder - core	SFIC as required	626	BE
1	Surface Closer	CLP8501 TBGN	689	NO
1	Kick Plate	K1050 10" X 2" LDW 4BE CSK	US32D	RO
1	Threshold	271A		PE
1	Gasketing	S88D		PE
1	Sweep	315CN		PE

Set: 16.0

Doors: 112, 113
Description: RESTROOM

3	Hinge (heavy weight)	T4A3786 4-1/2" x 4-1/2"	US26D	MK
1	Push Plate	70C-RKW	US32D	RO
1	Pull Plate	BF 110x70C	US32D	RO
1	Foot Pull	FP1230	US32D	RO
1	Surface Closer	8501 TBGN	689	NO
1	Kick Plate	K1050 4" X 1" LDW 4BE CSK	US32D	RO
1	Kick Plate	K1050 10" X 2" LDW 4BE CSK	US32D	RO
1	Door Stop	409 / 446	US32D	RO
1	Gasketing	S88D		PE

Set: 17.0

Doors: 104, 116, 117
Description: LAB

3	Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1	Mortise Lock (classroom)	JNR 8808FL A620	626	YA
1	Cylinder - core	SFIC as required	626	BE
1	Surface Closer	8501 TBGN	689	NO
1	Kick Plate	K1050 4" X 1" LDW 4BE CSK	US32D	RO
1	Kick Plate	K1050 10" X 2" LDW 4BE CSK	US32D	RO
1	Door Stop	409 / 446	US32D	RO
3	Silencer	608		RO

NOTE: EXISTING FRAME INTENDED TO REMAIN @ OPENING 116. FIELD VERIFY EXISTING CONDITIONS AND ENSURE NEW HARDWARE IS COMPATIBLE WITH EXISTING FRAME. REINFORCE EXISTING FRAME AS REQ

Set: 18.0

Doors: 128
Description: HVAC

3	Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1	Mortise Lock (storeroom)	JNR 8805FL A620	626	YA
1	Cylinder - core	SFIC as required	626	BE
1	Door Stop	409 / 446	US32D	RO
3	Silencer	608		RO

Set: 19.0

Doors: 120
Description: STOR

3	Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1	Mortise Lock (storeroom)	JNR 8805FL A620	626	YA
1	Cylinder - core	SFIC as required	626	BE
1	Door Stop	409 / 446	US32D	RO
3	Silencer	608		RO

Set: 20.0

Doors: 103
Description: JAN

3	Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1	Mortise Lock (storeroom)	JNR 8805FL A620	626	YA
1	Cylinder - core	SFIC as required	626	BE
1	Kick Plate	K1050 4" X 1" LDW 4BE CSK	US32D	RO
1	Door Stop	409 / 446	US32D	RO
1	Gasketing	S88D		PE

Set: 21.0

Doors: 121
Description: OFFICE

3	Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1	Mortise Lock (Entry)	JNR 8807FL A620	626	YA
1	Cylinder - core	SFIC as required	626	BE
1	Door Stop	409 / 446	US32D	RO
3	Silencer	608		RO

Set: 22.0

Doors: 127
Description: X-RAY

1	Pivot Set	L147	626	RF
1	Intermediate Pivot	ML19	626	RF
1	Passage Latch	JNR 8801FL Lead Lined	626	YA
1	Kick Plate	K1050 10" X 2" LDW 4BE CSK	US32D	RO
1	Door Stop	409 / 446	US32D	RO
3	Silencer	608		RO

NOTE: EXISTING FRAME INTENDED TO REMAIN. FIELD VERIFY EXISTING CONDITIONS AND ENSURE NEW HARDWARE IS COMPATIBLE WITH EXISTING FRAME. REINFORCE EXISTING FRAME AS REQ.

Set: 23.0

Doors: 106
Description: BREAK

1	Continuous Hinge	KCFMXX-HD1		PE
1	Passage Latch	JNR 8801FL	626	YA
1	Surface Closer	8501 TBGN	689	NO
1	Door Stop	409 / 446	US32D	RO
3	Silencer	608		RO

Set: 24.0

Doors: 105
Description: CONF

3	Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1	Passage Latch	JNR 8801FL	626	YA
1	Door Stop	409 / 446	US32D	RO
1	Gasketing	S88D		PE

Set: 25.0

Doors: 155, 160, 167, 172
Description: OH DOOR

1	Hardware	by mfg

END OF SECTION

SECTION 088000 - GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Glass.

B. Glazing compounds and accessories.

1.02 RELATED REQUIREMENTS

A. Section 079005 - Joint Sealers: Sealant and back-up material.

B. Section 08 4413 - Glazed Aluminum Curtain Walls.

C. Section 102800 - Toilet, Bath, and Laundry Accessories: Mirrors.

D. Section 08 4113 - Aluminum-Framed Entrances.

1.03 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials Current Edition.

B. ASTM C1036 - Standard Specification for Flat Glass 2021.

C. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass 2018.

D. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass 2019.

E. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings 2016.

F. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation 2019.

G. GANA (GM) - GANA Glazing Manual 2022.

H. GANA (SM) - GANA Sealant Manual 2008.

I. GANA (LGRM) - Laminated Glazing Reference Manual 2019.

J. IGMA TM-3000 - North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial & Residential Use 1990 (2016).

K. ASTM Standard F1642-04, Standard Test Method for Glazing and Glazing Systems subject to airblast loadings.

L. UFC 4-010-01 DoD Minimum Antiterrorism Standards for Buildings.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.

C. Samples: Submit two samples 12 by 12 inch (305 by 305 mm) in size of glass and plastic units, showing coloration and design.

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with GANA Glazing Manual and GANA Sealant Manual for glazing installation methods.

B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.

1.06 MOCK-UP

A. See section 08 4413 - Glazed Aluminum Curtain Walls.

1.07 WARRANTY

A. See Section 017800 - Closeout Submittals, for additional warranty requirements.

B. Sealed Insulating Glass Units: Provide a ten (10) year warranty to include coverage for seal failure, interpane dusting or misting, including replacement of failed units.

C. Laminated Glass: Provide a ten (10) year warranty to include coverage for delamination, including replacement of failed units.

PART 2 PRODUCTS

2.01 INSULATING GLASS UNITS

A. Type [IG-1] - Blast Resistant, Solar Control, Laminated Insulating Glass Units: Vision glass, double glazed.

1. Application: All exterior glazing unless otherwise indicated.

2. Performance Requirements:

a. Blast Mitigation Performance: Shall be tested or proven through analysis to meet ASTM F1642, GAS-TS01, and UFC 04-010-01 performance criteria

1) To meet UFC 04-010-01, B-3.1 Standard 10 for Windows and Skylights, the following options are available:

(a) Section B-3.1.3 ASTM F3348 Design Approach

b. Winter U-Value: 028

c. Solar Heat Gain Coefficient: 0.25

d. VLT (%): 33

3. Outdoor Lite:

a. Glass Thickness: (1/4") 6 mm, minimum type as required for blast resistance requirements.

b. Tint and Coating: Gray tent with triple silver, magnetron sputter vacuum deposition (MSVD) coating capable of achieving listed performance criteria.

c. Heat-Treatment: Tempered and Heat Strengthened as mandated for safety and by code.

4. Interspace Content: Air (1/2") 12.7 mm

5. Indoor Lite: Laminate as required for blast resistance requirements.

a. Laminate Outboard Lite:

1) Glass Thickness: (1/8") 3 mm +/- as required for blast resistance requirements.

2) Tint: Clear

3) Heat-Treatment: Tempered and Heat Strengthened as mandated for safety and by code.

b. Interlayer:

1) Type: PVB

2) Thickness: minimum as required for blast resistance requirements.

3) Color: Clear

c. Laminate Inboard Lite:

1) Glass Thickness: (1/8") 3 mm +/- as required for blast resistance requirements.

2) Tint: Clear

3) Heat-Treatment: Tempered and Heat Strengthened as mandated for safety and by code.

2.02 GLAZING UNITS

A. Type S-1 - Single Vision Glazing:

1. Application: All interior glazing unless otherwise indicated.

2. Type: Fully tempered float glass.

3. Tint: Clear.

4. Thickness: 1/4 inch (6 mm).

5. Polish all exposed edges.

2.03 GLASS MATERIALS

A. Float Glass: Provide float glass based glazing unless noted otherwise.

1. Annealed Type: ASTM C1036, Type I - Transparent Flat, Class 1 - Clear, Quality-Q3.

2. Heat-Strengthened and Fully Tempered Types: ASTM C1048, Kind HS and Kind FT.

3. Tinted Types: ASTM C1036, Class 2 - Tinted, color and performance characteristics as indicated.

4. Thicknesses: As indicated; for exterior glazing comply with requirements indicated for wind load design regardless of thickness indicated.

2.04 GLAZING ACCESSORIES

A. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot (25 mm for each square meter) of glazing or minimum 4 inch (100 mm) x width of glazing rabbet space minus 1/16 inch (1.5 mm) x height to suit glazing method and pane weight and area.

B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Minimum 3 inch (75 mm) long x one half the height of the glazing stop x thickness to suit application, self adhesive on one face.

C. Glazing Gaskets: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C 864 Option I.

D. Glazing Clips: Manufacturer's standard type.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that openings for glazing are correctly sized and within tolerance.

B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

3.02 PREPARATION

A. Clean contact surfaces with solvent and wipe dry.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

C. Prime surfaces scheduled to receive sealant.

D. Install sealants in accordance with manufacturer's instructions.

3.03 INSTALLATION - EXTERIOR/INTERIOR DRY METHOD (GASKET GLAZING)

A. Place setting blocks at 1/4 points with edge block no more than 6 inch (152 mm) from corners.

B. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.

C. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

3.04 INSTALLATION - PLASTIC FILM

A. Install plastic film with adhesive, applied in accordance with film manufacturer's instructions.

B. Place without air bubbles, creases or visible distortion.

C. Fit tight to glass perimeter with razor cut edge.

3.05 CLEANING

A. Remove glazing materials from finish surfaces.

B. Remove labels after Work is complete.

C. Clean glass and adjacent surfaces.

3.06 PROTECTION

A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.

END OF SECTION

SECTION 089100 - LOUVERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Louvers, frames, and accessories.

B. Materials included in this section shall meet the requirements for High Performance Sustainable Buildings for New Construction points for the following Sections:

1. 2-6.1.1 - Recycled Content

2. The contractor is expected to understand the HPSB requirements for these sections and include all applicable overhead in their base bid for the necessary documentation to achieve the above listed credits.

1.02 RELATED REQUIREMENTS

A. Section 01 3325 - Project Sustainability Summary

B. Section 01 3329 - Sustainable Design Reporting

C. Section 01 6000 - Product Requirements

D. Section 01 7419 - Construction Waste Management and Disposal

E. Section 076200 - Sheet Metal Flashing and Trim.

F. Section 079005 - Joint Sealers.

1.03 REFERENCE STANDARDS

A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum 2020.

B. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2022.

C. AMCA 500-L - Laboratory Methods of Testing Louvers for Rating 2012 (Reapproved 2015).

D. AMCA 511 - Certified Ratings Program Product Rating Manual for Air Control Devices 2021.

E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2022.

F. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar 2015.

G. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate 2014.

H. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric) 2014.

I. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes 2021.

J. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric) 2021.

1.04 SUBMITTALS

A. See Section 01 3001 - Submittals, for submittal procedures.

B. Product Data: Provide data describing design characteristics, maximum recommended air velocity, design free area, materials and finishes.

C. Shop Drawings: Indicate louver layout plan and elevations, opening and clearance dimensions, tolerances; head, jamb and sill details; blade configuration, screens, blankout areas required, and frames.

D. Samples: Submit two samples 2 by 2 inches (50 by 50 mm) in size illustrating finish and color of exterior and interior surfaces.

E. Test Reports: Independent agency reports showing compliance with specified performance criteria.

F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

G. Maintenance Data: Include lubrication schedules and adjustment requirements .

H. Sustainability Submittals, Product data for HPSB Compliance:

1. For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content.

   a. Include statement indicating costs (sell price for each product having recycled content)

   b. Include Total weight of products provided

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with minimum three years of documented experience.

1.06 WARRANTY

A. See Section 017800 - Closeout Submittals, for additional warranty requirements.

B. Provide five year manufacturer's warranty against distortion, metal degradation, and connection failures of louver components.

1. Finish: Include twenty year coverage against degradation of exterior finish.

1.07 SUSTAINABILITY REQUIREMENTS

A. Contractor shall endeavor to provide materials with a high recycled content:

1. See Part 2 of this specification section for specific recycled content thresholds, if applicable.

PART 2 PRODUCTS

2.01 LOUVERS

A. Louvers: Factory fabricated and assembled, complete with frame, mullions, and accessories; AMCA Certified in accordance with AMCA 511.

1. Wind Load Resistance: Design to resist positive and negative wind load of 25 psf (of 1.2 kPa) without damage or permanent deformation.

2. Intake Louvers: Design to allow maximum of 0.01 oz/sq ft (3.1 g/sq m) water penetration at calculated intake design velocity based on design air flow and actual free area, when tested in accordance with AMCA 500-L.

3. Drainable Blades: Continuous rain stop at front or rear of blade aligned with vertical gutter recessed into both jambs of frame.

B. Stationary Louvers, Type Drainable: Horizontal blade, extruded aluminum construction, with intermediate mullions matching frame.

1. Free Area: 50 percent, minimum.

2. Blades: Straight.

3. Blades: V-shaped, sight-proof.

4. Frame: 5 inches deep (127 mm deep), channel profile; corner joints mitered and, with continuous recessed caulking channel each side.

5. Aluminum Thickness: Frame 12 gage, 0.0808 inch (2.05 mm) minimum; blades 12 gage, 0.0808 inch (2.05 mm) minimum.

6. Aluminum Finish: Superior performing organic coatings; finish welded units after fabrication.

2.02 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M).

B. Insect Screen: 18 x 16 size aluminum mesh.

C. Recycled Content: For aluminum products: Minimum Total Recovered Materials Content - 30%

2.03 FINISHES

A. Superior Performing Organic Coatings System: Polyvinylidene fluoride (PVDF) multi-coat superior performing organic coatings system complying with AAMA 2605, including at least 70 percent PVDF resin having minimum total dry film thickness (DFT) of 1.2 mils, 0.0012 inch (0.030 mm).

2.04 ACCESSORIES

A. Insect Screen: 18 x 16 size aluminum mesh.

B. Fasteners and Anchors: Galvanized steel.

C. Head and Sill Flashings: See Section 076200.

D. Sealant for Setting Sills and Sill Flashing: Non-curing butyl type.

E. Sealant: as specified in Section 07 9005.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that prepared openings and flashings are ready to receive this work and opening dimensions are as indicated on shop drawings.

B. Verify that field measurements are as indicated.

3.02 INSTALLATION

A. Install louver assembly in accordance with manufacturer's instructions.

B. Coordinate with installation of flashings by others.

C. Install louvers level and plumb.

D. Align louver assembly to ensure moisture shed from flashings and diversion of moisture to exterior.

E. Secure louver frames in openings with concealed fasteners.

F. Install perimeter sealant and backing rod in accordance with Section 079005.

G. Coordinate with installation of mechanical ductwork.

3.03 CLEANING

A. Strip protective finish coverings.

B. Clean surfaces and components.

END OF SECTION

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SECTION 090561 - COMMON WORK RESULTS FOR FLOORING PREPARATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This section applies to floors identified in Contract Documents that are receiving the following types of floor coverings: All specified testing will be provided by the contractor.

1. Resilient tile and sheet.
2. Thin-set ceramic tile and stone tile.
3. All other floor finishes as sepcified in individual sections.

B. Preparation of new concrete floor slabs for installation of floor coverings.

C. Testing of concrete floor slabs for moisture and alkalinity (pH).

D. Remediation of concrete floor slabs due to unsatisfactory moisture or alkalinity (pH) conditions.

1. Contractor shall perform all specified remediation of concrete floor slabs. If such remediation is indicated by testing agency's report and is due to a condition not under Contractor's control or could not have been predicted by examination prior to entering into the contract, a contract modification will be issued.

1.02 RELATED REQUIREMENTS

A. Section 014000 - Quality Requirements: Additional requirements relating to testing agencies and testing.

1.03 REFERENCE STANDARDS

A. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring 2022.

B. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride 2022.

C. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes 2019a.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate scheduling of cleaning and testing, so that preliminary cleaning has been completed for at least 24 hours prior to testing.

1.05 SUBMITTALS

A. Testing Agency's Report:

1. Description of areas tested; include floor plans and photographs if helpful.
2. Summary of conditions encountered.
3. Moisture and alkalinity (pH) test reports.
4. Copies of specified test methods.
5. Recommendations for remediation of unsatisfactory surfaces.
6. Submit report to the Architect.
7. Submit report not more than two business days after conclusion of testing.

1.06 QUALITY ASSURANCE

A. Moisture and alkalinity (pH) testing shall be performed by an independent testing agency employed and paid by Contractor.

B. Testing Agency Qualifications: Independent testing agency experienced in the types of testing specified.

1. Submit evidence of experience consisting of at least 3 test reports of the type required, with project Owner's project contact information.

C. Contractor's Responsibility Relating to Independent Agency Testing:

1. Provide access for and cooperate with testing agency.
2. Confirm date of start of testing at least 10 days prior to actual start.
3. Allow at least 4 business days on site for testing agency activities.
4. Achieve and maintain specified ambient conditions.
5. Notify the Government when specified ambient conditions have been achieved and when testing will start.

1.07 FIELD CONDITIONS

A. Maintain ambient temperature in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 65 degrees F (18 degrees C) or more than 85 degrees F (30 degrees C).

B. Maintain relative humidity in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 40 percent and not more than 60 percent.

PART 2 PRODUCTS

PART 3 EXECUTION

3.01 CONCRETE SLAB PREPARATION

A. PROPER SURFACE PREPARATION INCLUDES THE FOLLOWING:

1. Removal of existing floor coatings
2. Decontamination of the concrete surface
3. Creation of surface profile
4. Repair of surface irregularities

B. DECONTAMINATION OF THE CONCRETE SURFACE

1. Decontamination of the concrete surface requires the removal of oils, grease, wax, fatty acids and other contaminants, and may be accomplished by the use of detergent scrubbing with a heavy duty cleaner/degreaser, low pressure water cleaning (less than 5,000 psi), steam cleaning, or chemical cleaning. The success of these methods is dependent upon the depth of penetration of the contaminant; which is completely dependent upon the contaminant's viscosity, the concrete's permeability and the duration of exposure. Special care should be taken when preparing concrete at an "in use" facility for repair, replacement or an initial floor topping.
2. Test concrete substrate for moisture vapor emission using test methods recommended by manufacturer of flooring system being installed.

C. CREATION OF SURFACE PROFILE

1. A. Creation of surface profile can be accomplished by a number of methods each utilizing a selection of tools, equipment and materials to accomplish the intended

purpose, (See METHODS OF SURFACE PREPARATION below). Selection is dependent upon the type of surface to be prepared and the type of system to be installed. In addition, floors, trenches each have their own particular requirements. The type and thickness of the selected flooring system also plays an important role in the selection process. Regardless of the method selected or tools employed, the contractor must provide a surface that will accept the application of flooring products and allow the mechanical bond of the flooring system securely to the concrete. The type of service the structure will be subjected to, will also help to define the degree of profile required. The surface profile is the measure of the average distance from the peaks of the surface to the valleys as seen through a cross sectional view of the surface of the concrete.

2. This dimension is defined pictorially and through physical samples in the ICRI Technical Guideline No 03732, and is expressed as a Concrete Surface Profile number (CSP 1-9).

3. Methods of Surface Preparation

   a. Depending upon conditions of the concrete one or more methods of surface preparation may be required. It is common for decontamination to precede mechanical preparation, and if necessary a second decontamination to follow.

   b. The preferred methods for creation of a surface profile, including the removal of dirt, dust, laitance and curing compounds, is steel shotblasting, abrasive (sand) blasting or scarifying. The steel shotblasting or vacuum blasting process is commonly referenced by equipment brand names, such as, Blastrac, Vacu-Blast, Shot-Blast, etc. Vertical and overhead surfaces, such as cove base, wall, and ceiling surfaces shall be prepared utilizing methods of grinding, scarifying, abrasive (sand) blasting, needle scaling, or vertical steel shotblasting. The following table provides a guide for the degree of surface profile required for the coating or overlay to be applied and the preparation methods used to generate each profile. Provide written instruction from manufacturer to the Government regarding profile requirements and recommended method for achieving profile.

Application	Profile	Preparation
Sealers	0-3 mils	Detergent scrub Low-pressure Water Acid Etching (not recommended) Grinding
Thin Film	4-10 mils	Grinding Abrasive Blast Steel Shot Blast
High Build	10-40 mils	Abrasive Blast Steel Shot Blast

		Scarifying
Self-Leveling	50 mils-1/8 inch	Abrasive Blast Steel Shot Blast Scarifying Needle Scaling
Polymer Overlay	1/8-1/4 inch	Abrasive Blast Steel Shot Blast Scarifying Needle Scaling Scabbling Flame Blasting Milling/rotomilling

4. Other surface preparation methods are mentioned in ADDITIONAL SURFACE PREPARATION REFERENCES.

D. REPAIR OF SURFACE IRREGULARITIES

1. Repair of surface irregularities including bugholes, spalls, cracks, deteriorated joints, slopes, areas near transition zones, such as around drains, floor boxes, doorways, etc. must be repaired prior to the placement of the flooring system and/or the system must be designed to off-set the thickness of the irregularities. For bugholes and other minor surface irregularities, fill using materials recommended by manufacturer of flooring system. For treatment of cracks and joints refer to the section below entitled “Crack Isolation”.

E. CRACK ISOLATION

1. The performance of elastomeric products, requires a relatively uniform dry film thickness to resist drying shrinkage and thermal movement of the concrete, while maintaining a seamless bridge or seal over the concrete. Therefore it is critical that all mortar splatter, protrusions, ridges, penetrations, or sharp projections in the surface of the concrete, be ground smooth or otherwise made smooth, in addition to the normal surface preparation outlined above.

2. Prior to application of an elastomeric system, control/contraction joints, construction joints, and cracks should be sealed with the selected system flexible sealant as recommended by manufacturer of flooring system. This coating should extend a minimum of 6” on either side of the joint or crack. The entire surface area should then receive the specified crack isolation system. Isolation and/or expansion joints should be detailed in accordance with the floor system manufacturer’s recommendations.

3. General Polymer systems can be applied to a variety of substrates if the substrate is properly prepared. Preparation of surfaces other than concrete or steel, such as wood, concrete block, brick, quarry tile, glazed tile, cement terrazzo, vinyl composition tile, plastics and existing polymer systems, can be accomplished to receive bonded polymer sealers, coatings, or toppings. For questions regarding a

substrate other than concrete or steel, or a condition not mentioned in this guideline, contact the product Technical Service Department prior to starting the project. For steel surfaces, refer to Guideline Instructions for Surface Preparation of Structural Steel, Form G-2.Repair of surface irregularities including bugholes, spalls, cracks, deteriorated joints, slopes, areas near transition zones, such as around drains, floor boxes, doorways, etc. must be repaired prior to the placement of the flooring system and/or the system must be designed to off-set the thickness of the irregularities.

F. ADDITIONAL SURFACE PREPARATION REFERENCES

1. Important and relevant information on surface preparation of concrete is available by referencing the following codes, standards, and guidelines.

   a. SSPC The Society for Protective Coatings, 40 24th Street, 6th Floor, Pittsburgh, Pa. 15222-4643, (412) 281-2331.

      1) SSPC-SP 13 Surface Preparation of Concrete

      2) SSPC-TU 2/NACE 6G197 Design, Installation, and Maintenance of Coating Systems for Concrete Used in Secondary Containment

   b. ICRI International Concrete Repair Institute, 38800 Country Club Drive Farmington Hills, MI 48331, (248) 848-3809

   c. Technical Guideline No.03732, “Selecting and Specifying Concrete Surface

      1) Preparation for Sealers, Coatings, and Polymer Overlays”. Includes visual standards to act as a guide in defining acceptable surface profiles for the application of industrial coatings and polymer floor toppings.

      2) Technical Guideline No.03730, “Guide for Surface Preparation for the Repair of Deteriorated Concrete Resulting from Reinforcing Steel Corrosion”.

   d. ASTM American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, (610) 832-9585

      1) ASTM D 4258 “Practice for Surface Cleaning Concrete for Coating”

      2) ASTM D 4260 “Standard Practice for Acid Etching Concrete”

      3) ASTM D 4261 “Practice for Surface Cleaning Unit Masonry for Coating”

4) ASTM D 4262 “Test Method for pH of Chemically Cleaned or Etched Concrete Surfaces”The performance of elastomeric products, requires a relatively uniform dry film thickness to resist drying shrinkage and thermal movement of the concrete, while maintaining a seamless bridge or seal over the concrete. Therefore it is critical that all mortar splatter, protrusions, ridges, penetrations, or sharp projections in the surface of the concrete, be ground smooth or otherwise made smooth, in addition to the normal surface preparation outlined above.

3.02 MOISTURE VAPOR EMISSION TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.

C. Test in accordance with ASTM F1869 and as follows.

1. Provide a minimum of 3 tests for the first 1,000 square feet of floor area and one additional test for each additional 1,000 square feet of floor area. Provide additional testing if required by the applicable floor finish manufacturer(s).

D. Plastic sheet test and mat bond test may not be substituted for the specified ASTM test method, as those methods do not quantify the moisture content sufficiently.

E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if test values exceed 3 pounds per 1000 square feet (1.4 kg per 93 square meters) per 24 hours.

F. Report: Report the information required by the test method.

3.03 INTERNAL RELATIVE HUMIDITY TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.

C. Test in accordance with ASTM F2170 Procedure A and as follows.

1. Provide a minimum of 3 tests for the first 1,000 square feet of floor area and one additional test for each additional 1,000 square feet of floor area. Provide additional testing if required by the applicable floor finish manufacturer(s).

D. Testing with electrical impedance or resistance apparatus may not be substituted for the specified ASTM test method, as the values determined are not comparable to the ASTM test values and do not quantify the moisture content sufficiently.

E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if any test value exceeds 75 percent relative humidity.

F. Report: Report the information required by the test method.

3.04 ALKALINITY TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. The following procedure is the equivalent of that described in ASTM F710, repeated here for the Contractor's convenience.

C. Use a wide range alkalinity (pH) test paper, its associated chart, and distilled or deionized water.

D. Place several drops of water on a clean surface of concrete, forming a puddle approximately 1 inch (25 mm) in diameter. Allow the puddle to set for approximately 60 seconds, then dip the alkalinity (pH) test paper into the water, remove it, and compare immediately to chart to determine alkalinity (pH) reading.

E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if alkalinity (pH) test value is over 10.

F. Provide a minimum of 3 tests for the first 1,000 square feet of floor area and one additional test for each additional 1,000 square feet of floor area. Provide additional testing if required by the applicable floor finish manufacturer(s).

END OF SECTION

SECTION 092116 - GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Performance criteria for gypsum board assemblies.

B. Metal stud wall framing.

C. Metal channel ceiling framing.

D. Gypsum wallboard.

E. Non-acoustical joint treatment and accessories.

F. Mold resistant gypsum wallboard

G. Cementitious Board and Backer

H. Materials included in this section shall meet the requirements for High Performance Sustainable Buildings for New Construction points for the following Sections:

1. 2-5.3.2 - Reduce Volatile Organic Compounds (VOC) Low-Emitting Materials
2. 2-6.1.1 - Recycled Content
3. 2-6.1.2 - Biologically Based Products
4. The contractor is expected to understand the HPSB requirements for these sections and include all applicable overhead in their base bid for the necessary documentation to achieve the above listed credits.

1.02 RELATED REQUIREMENTS

A. Section 01 3325 - Project Sustainability Summary

B. Section 01 3329 - Sustainable Design Reporting

C. Section 01 6000 - Product Requirements

D. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions

E. Section 01 7419 - Construction Waste Management and Disposal

F. Section 061000 - Rough Carpentry: Wood blocking product and execution requirements.

G. Section 072100 - Thermal Insulation: Batt insulation.

H. Section 09 3000 - Tiling

I. Section 078400 - Firestopping: Top-of-wall assemblies at fire rated walls.

J. Section 079200 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.

1.03 REFERENCE STANDARDS

A. Intelligence Community Directive Number 705, Current Edition.

B. ASTM C473 - Standard Test Methods for Physical Testing of Gypsum Panel Products.

C. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board 2017 (Reapproved 2022).

D. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members 2018.

E. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products 2020.

F. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board 2020.

G. ASTM C 919 - Standard Practice for use of Sealants in Acoustical Applications.

H. ASTM C1288 - Standard Specification for Fiber-Cement Interior Substrate Sheets 2017.

I. ASTM C1396/C1396M - Standard Specification for Gypsum Board 2017.

J. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber 2021.

K. GA-216 - Application and Finishing of Gypsum Panel Products 2021.

L. GA-600 - Fire Resistance and Sound Control Design Manual 2021.

M. UL (FRD) - Fire Resistance Directory Current Edition.

1.04 SUBMITTALS

A. See Section 01 3001 - Submittals for Submittal procedures.

B. Shop Drawings: Indicate special details associated with fireproofing and acoustic seals.

C. Product Data: Provide data on metal framing, gypsum board, accessories, and joint finishing system.

D. Test Reports: For stud framing products that do not comply with ASTM C645 or ASTM C754, provide independent laboratory reports showing maximum stud heights at required spacings and deflections.

E. VOC Content Limitations: For the specified products, submit documentation of conformance with Specification Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

F. Sustainability Submittals, Product data for HPSB Compliance:

1. For products having recycled content, provide documentation indicating percentages by weight of postconsumer and pre-consumer recycled content.

   a. Include statement indicating costs (sell price for each product having recycled content)

   b. Include the total weight of products provided

2. For products having Biologically Based Products, documentation indicating percentages of Biologically-Based Products

3. For products containing VOCs, documentation (material safety data sheets (MSDS), third-party certificates, or test reports) showing printed statement of VOC content.

4. VOC Content Limitations: For the specified products, submit documentation of conformance with Specification Section 01 6116 – Volatile Organic Compound (VOC) Content Restrictions.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing gypsum board installation and finishing, with minimum 5 years of experience.

B. Copies of Documents at Site: Maintain at the project site a copy of each referenced document that prescribes execution requirements.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

A. Provide completed assemblies complying with ASTM C840 and GA-216.

B. Refer to Drawings for wall type assemblies and STC ratings, if applicable.

2.02 METAL FRAMING MATERIALS (for interior partitions, refer to drawings for width & height)

A. Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/120 at 5 psf (L/120 at 240 Pa).

1. Studs: "C" shaped with flat or formed webs with knurled faces.

B. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.

C. Recycled Content: For Steel Products: Minimum Total Recovered Materials Content - 30%

2.03 BOARD MATERIALS

A. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.

1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.

2. At Assemblies Indicated with Fire-Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.

3. Thickness:

a. Vertical Surfaces: 5/8 inch (16 mm).

b. Ceilings: 5/8 inch (16 mm). (at radiused ceilings (noncompound curved) the contractor may have the option to use 1 layers of 1/4 inch and one layer of to obtain radiused shape shown in lieu of 5/8 inch

c. Multi-Layer Assemblies: Thicknesses as indicated on drawings.

4. Mold Resistant Paper Faced Products:

a. Resists modle growth per ASTM G21 with a score of 0.

b. Resists the growth of mold per ASTM D3273 with a score of 0.

c. Less than 5% water absorption per ASTM C473.

5. Biobased Content: For Gypsum Products: Minimum Biobased Content per USDA: 94%

B. Backing Board For areas to support tile surfaces:

1. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.

2. ASTM Cement-Based Board: Non-gypsum-based, cementitious board complying with ASTM C1288.

a. Thickness: 5/8 inch (15.875 mm).

2.04 ACCESSORIES

A. Beads, Joint Accessories, and Other Trim: ASTM C1047, galvanized steel, unless noted otherwise.

B. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.

1. Paper Tape: 2 inch (50 mm) wide, creased paper tape for joints and corners, except as otherwise indicated.

2. Ready-mixed vinyl-based joint compound.

3. Locate Studs more frequently than 16" on center where required based upon wall height and applicable acoustical ratings.

C. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inch (0.84 mm) in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion resistant.

D. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch (0.84 to 2.84 mm) in Thickness: ASTM C954; steel drill screws, corrosion resistant.

E. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

3.02 FRAMING INSTALLATION

1. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.

2. Suspended Ceilings and Soffits: Space framing and furring members as indicated.
   a. Laterally brace entire suspension system.
3. Studs: Space studs at 16 inches on center (at 406 mm on center).
   a. Extend partition framing to structure where indicated and to ceiling in other locations.
   b. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.
4. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.
5. Blocking: Install wood blocking for support of:
   a. Wall mounted cabinets.
   b. Toilet partitions.
   c. Toilet accessories.
   d. In all locations noted elsewhere
   e. As required for the secure installation of any product to be attached to metal /stud gypsum partitions or ceilings

3.03 BOARD INSTALLATION

A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

B. Single-Layer Non-Rated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
   1. Exception: Tapered edges to receive joint treatment at right angles to framing.

C. Installation on Metal Framing: Use screws for attachment of gypsum board except face layer of non-rated double-layer assemblies, which may be installed by means of adhesive lamination.

3.04 INSTALLATION OF TRIM AND ACCESSORIES

A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.

B. Corner Beads: Install at external corners, using longest practical lengths.

C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

3.05 JOINT TREATMENT

A. Paper Faced Gypsum Board: Use paper joint tape, bedded with ready-mixed vinyl-based joint compound and finished with ready-mixed vinyl-based joint compound.

B. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:

1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.

2. Level 1: Wall areas above finished ceilings, whether or not accessible in the completed construction.

C. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.

1. Feather coats of joint compound so that camber is maximum 1/32 inch (0.8 mm).

3.06 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet (3 mm in 3 m) in any direction.

END OF SECTION

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SECTION 093000 - TILING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Tile for floor applications.

B. Tile for wall applications.

C. Tile accessories.

1.02 RELATED REQUIREMENTS

A. Section 01 2300 - Bid Options.

B. Section 079200 - Joint Sealants: Sealing joints between tile work and adjacent construction and fixtures.

C. Section 01 6116 - Volatile Organic Compound (VOC) restrictions.

D. Division 22 Plumbing.

1.03 REFERENCE STANDARDS

A. ANSI A108/A118/A136.1 - Specifications for the Installation of Ceramic Tile 2020.

B. ANSI A108.1a - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar 2017.

C. ANSI A108.1b - American National Standard Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar 2017.

D. ANSI A108.1c - Contractor's Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar 1999 (Reaffirmed 2021).

E. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesive or Water Cleanable Tile-Setting Epoxy Adhesive 2019.

F. ANSI A108.5 - American National Standard Specifications for Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar 2021.

G. ANSI A108.6 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grout Epoxy 1999 (Reaffirmed 2019).

H. ANSI A108.8 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout 1999 (Reaffirmed 2019).

I. ANSI A108.9 - American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout 1999 (Reaffirmed 2019).

J. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework 2017.

K. ANSI A108.12 - American National Standard for Installation of Ceramic Tile with EGP (Exterior Glue Plywood) Latex-Portland Cement Mortar 1999 (Reaffirmed 2019).

L. ANSI A108.13 - American National Standard for Installation of Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone 2005 (Reaffirmed 2021).

M. ANSI A108.19 - American National Standard Specifications for Interior Installation of Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs by the Thin-Bed Method Bonded with Modified Dry-Set Cement Mortar or Improved Modified Dry-Set Cement Mortar 2020.

N. ANSI A118.3 - American National Standard Specifications for Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive 2021.

O. ANSI A118.4 - American National Standard Specifications for Modified Dry-Set Cement Mortar 2019.

P. ANSI A118.10 - American National Standard Specifications for Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone 2014 (Reaffirmed 2019).

Q. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation 2022.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.05 SUBMITTALS

A. See Section 01 3001 - Submittals for Submittal procedures.

B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.

C. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods.

D. Samples: Mount tile (with specified mortar) and apply specified grout on plywood panels.

1. 24x24 for each tile type specified, illustrating patterns. Sample shall be numbered and receive written approval by the Government prior to proceeding.

E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

1. See Section 016000 - Product Requirements, for additional provisions.

2. Extra Tile: 1 percent of each size, color, and surface finish combination.

1.06 QUALITY ASSURANCE

A. Maintain one copy of and ANSI A108/A118/A136.1 and TCNA (HB) on site.

B. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum five years of documented experience.

C. Installer Qualifications: Company specializing in performing tile installation, with minimum of five years of documented experience.

1.07 MOCK-UP

A. See Section 014000 - Quality Requirements, for general requirements for mock-up.

B. Construct tile mock-up, utilizing approved samples incorporating all components specified for the location. Receive written approval by the Government and prior to proceeding.

1. Minimum size of mock-up is 100 S.F. and should include transitions of patterns/colors as selected by the Government.

PART 2 PRODUCTS

2.01 TILE

A. Refer to drawings for types, sizes, configuration, and colors.

1. Substitutions: See Section 016000 - Product Requirements.

2.02 TRIM AND ACCESSORIES

A. Tile Trim: Matching Out & In Corners shapes in sizes coordinated with field tile. Refer to drawings.

1. Applications: Refer to drawings for details of metal trim. All metal trim to be stainlesss steel type.

2.03 SETTING MATERIALS

A. Latex-Portland Cement Mortar Bond Coat: ANSI A118.4, ANSI A118.15

1. Product Properties:

a. ANSI A118.15, 7.2.5, 28 Day Cure Porcelain Tile Tear Strength: 475-575 psi (3.3-4.0 MPa)

b. ANSI A118.15, 7.2.4, Shear Bond Porcelain Tile Water Immersion: 250-300 psi (1.7- 2.4 MPa)

c. ANSI A118.15, 7.2.7, 28 Day Heat Aging Tile Shear Strength: 600-700 psi (4.1-4.8 MPa)

d. ANSI A118.11, 4.1.2, 28 Day Cure Quarry Tile to Plywood Shear Bond: 250-300 psi (1.7-2.1 MPa)

e. ISO 13007-2, 4.4.2, 28 Day Cure Tensile Adhesive Strength: 1.8 - 2.6 MPa (261-377 psi)

f. ISO 13007-2, 4.4.3, 7 Day Cure 21 Day Water Immersion Tensile Adhesive Strength: 1.3-1.5 MPa (174-221 psi)

g. ISO 13007-2, 4.4.4, 14 Day Cure 14 Day Heat Age Tensile Adhesive Strength: 2.4-3.0 MPa (345-438 psi)

h. ISO 13007-2, 4.4.5, 7 Day Cure, 21 Day Water Immersion 25 Freeze/Thaw Cycle Tensile Adhesive Strength: 2-1.7 MPa (171-247 psi)

i. ISO 13007-2, 4.1, Open Time after 30 Minutes: 1.3-1.9 MPa (190-283 psi)

j. ISO 13007-2, 4.2, Slip: 0.5 mm (0.02 inches)

k. ISO 13007-2, 4.5, Transverse Deformation: 3.2-3.6 mm (0.13 - 0.14 inches)

2.04 MORTAR MATERIALS

A. Mortar Bed Materials: Portland cement, sandand water.

B. Mortar Bond Coat Materials:

1. Polymer Modified Portland Cement Base: ANSI A118.11, ANSI A118.15, ANSI A118.4.

C. Must be recommended by manufacturer for specific use and acceptable with other specified products prior to ordering of material. Submit written recommendation for approval by the Government.

2.05 GROUTS

A. Epoxy Grout: ANSI A118.3 chemical resistant and water-cleanable epoxy grout.

1. Product Properties:

a. ANSI A118.3 E5.1, Water Cleanability: Water Cleanable at 80 Minutes

b. ANSI A118.3 E5.2, Initial Set Service Strength: > 2 hours< 24 hours

c. ANSI A118.3 E5.3, Shrinkage: 0.10%

d. ANSI A118.3 E 5.4, Vertical Joint Sag: Pass

e. ANSI A118.3 E5.5, Quarry/Quarry Bond Strength: 1100 psi (7.6 MPa)tile failure

f. ANSI A118.3 E5.6, Compressive Strength: 3800 psi (26.2 MPa) 7 days.

g. ANSI A118.3 E5.7, Tensile Strength: 1100 psi (7.6 MPa) 7 days.

h. ANSI A118.3 E5.8, Thermal Shock: 900 psi (6.2 MPa)

i. ISO 13007-4, 4.4, Abrasion Resistance: 48 mm3

j. ISO 13007-4, 4,1,3, Flexural Strength Under Standard Conditions: 35.9 MPa

k. ISO 13007-4, 4.1.4, Compressive Strength Under Standard Conditions: 57.8 MPa

l. ISO 13007-4, 4.3, Shrinkage: 1.05 mm/m

m. ISO 13007-4, 4.2, Water Absorption after 240 min: 0.032 gm

n. Chemical Resistance as follows:

	splash	intermittent exposure	continuous exposure
Reagent	30 min	24hr	7d
Lactic acid 5%	R	R	R
Acetic Acid 5%	R	R	R
Formic Acid 3%	R	R	NR
Sulfuric Acid 20%	R	R*	NR*
Ethanol 10%	R	R	R
Ethanol 96%	R	R	NR
sea water (3.5%)	R	R	R
KOH 45%	R	R	R
10% Oxalic Acid	R	R	R
5% Benzoic Acid	R	R	R
10% Potassium Permanganate	R*	R*	R*
1% Potassium Permanganate	R*	R*	R*
Distilled Water	R	R	R
Mineral Water	R	R	R
Methanol	R	NR	NR
Isopropanol (Windex)	R	R	R
Chloroform	NR	NR	NR
Methylene Chloride	NR	NR	NR
Tartaric Acid 50%	R	R	R
Tannic Acid 50%	R	R	R
5% Sodium Hypochlorite (Bleach)	R	R	NR
Xylene	R	R	R
Toluene	R	R	NR
MEK	R	NR	NR
*grout color may change			

2.06 ACCESSORY MATERIALS

A. Crack Suppression Membrane (at all floors). Specifically designed for bonding to substrate. Trowel applied flexible fiber- mesh-reinforced waterproofing and crack - isolation membrane. Install at all locations to receive hard tile where cracks exist. Verify compatability with adjacent materials. Follow manufacturers recommended

techniques in reference to application and number of coats.

B. Waterproofing Membrane Provide waterproof membrane at all Tiled Floor Areas and all Toilet Room and Janitor wet walls to a height of 6 feet and extending on perpenidular tiled walls for six feet horizontally.: Specifically designed for bonding to cementitious substrate under thick mortar bed or thin-set tile; complying with ANSI A118.10 and ANSI A118.12.

1. Type: Fluid-applied.

2. Material Properties:

   a. ANSI A118.10 (4.1), Fungus Resistance: Pass

   b. ANSI A118.10 (4.2) Seam Strength: > 95 lbs/inch width (>166.4 N/cm width)

   c. ANSI A118.10 (4.3) Breaking Strength: 2400 lbs/in2 (16.5 MPa)

   d. ANSI A118.10 (4.4) Dimensional Stability: No Change

   e. ANSI A118.10 (4.5) Waterproofness: Pass

   f. ANSI A118.10 (5.6) Shear Strength: 280 psi (1.9 MPa)

   g. ANSI A118.10 (6); ASTM C627; TCA Rating, System Performance: Cycles 1-14 “Extra Heavy”

   h. Fed Spec. TT-C_00555 (Mod.), Water Permeance: Excellent

   i. ASTM E96-80 (Inverted Water Method), Water Vapor Transmission: 2.4 grains / h-Ft2 (1.6 g/h-m2)

   j. ASTM E96-80 (Inverted Water Method) , Water Vapor Permeance: 2.9 perms (165.5 NGB/OA-s-m2)

   k. ASTM D751-89, Elongation: 20-30%

   l. LIL 1013-92, Thickness: 0.02 inches (0.5 mm)

   m. Chemical Resistance, Full Immersion 90 Day, Not Affected by the following:

      1) Brine Solution

      2) Sugar Solution

      3) Milk

4) 10% Citric Acid

5) 3.5% HCI Acid

6) 5% Acetic Acid

7) 1% Alkali

n. ANSI A118.12.5.4, Crack Suppression: Pass 1/8" (3 mm)

3. Follow manufacturers recommended techniques in reference to number of coats.

C. Mesh Tape 2-inch self-adhesive fiberglass tape.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.

C. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of setting materials to sub-floor surfaces.

D. Verify that concrete sub-floor surfaces are ready for tile installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by tile manufacturer and setting materials manufacturer.

E. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Protect surrounding work from damage.

B. Vacuum clean surfaces and damp clean.

C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

D. Install cementitious backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of dry-set mortar to a feather edge.

3.03 INSTALLATION - GENERAL

A. Install tile and thresholds and grout in accordance with applicable requirements of ANSI A108.1a through ANSI A108.19 , manufacturer's instructions, and TCNA (HB) recommendations.

B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.

C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.

D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.

E. Form internal angles square and external angles bullnosed.

F. Install thresholds where indicated.

G. Sound tile after setting. Replace hollow sounding units.

H. Keep control and expansion joints free of mortar, grout, and adhesive.

I. Keep expansion joints free of adhesive or grout. Apply sealant to joints. Sealant to match grout color.

J. Allow tile to set for a minimum of 48 hours prior to grouting or more if recommended by manufacturer. .

K. Grout tile joints unless otherwise indicated. Use standard grout unless otherwise indicated.

L. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

M. Apply sealant to junction of tile and dissimilar materials and junction of dissimilar planes.

N. When Contractor begins installation of tile, this shall indicate his acceptance of substrate.

O. Install waterproof membrane shall be per manufacturers instructions.

3.04 INSTALLATION - FLOORS - THIN-SET METHODS - ALL TILE FLOOR AREAS RECEIVING WATERPROOF MEMBRANES.

A. Over interior concrete substrates, install in accordance with The Tile Council of North America Handbook Method F113, with with polymer modified portland cement mortar and urethane grout. Waterproof as noted., unless otherwise indicated. Provide waterproof membrane to tile floor areas.

3.05 INSTALLATION - WALL TILE ON CONCRETE MASONRY UNITS

A. Over interior concrete and masonry install in accordance with The Tile Council of North America Handbook Method W202, thin-set with polymer modified portland cement mortar, urethane grout, with waterproof membrane as noted elsewhere.

3.06 CLEANING

A. Clean tile and grout surfaces.

3.07 PROTECTION

A. Do not permit traffic over finished floor surface for 4 days after installation.

3.08 SCHEDULE

A. Refer to drawings for the locations of tile, the type of tile, and the patterns of tile

END OF SECTION

SECTION 095100 - ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Suspended metal grid ceiling system.

B. Acoustical units.

C. Materials included in this section shall meet the requirements for High Performance Sustainable Buildings for New Construction points for the following Sections:

1. 2-5.3.2 - Reduce Volatile Organic Compounds (VOC) Low-Emitting Materials

2. 2-6.1.1 - Recycled Content

3. The contractor is expected to understand the HPSB requirements for these sections and include all applicable overhead in their base bid for the necessary documentation to achieve the above listed credits.

1.02 RELATED REQUIREMENTS

A. Section 01 3325 - Project Sustainability Summary

B. Section 01 3329 - Sustainable Design Reporting

C. Section 01 6000 - Product Requirements

D. Section 016116 - Volatile Organic Compound (VOC) Content Restrictions.

1.03 REFERENCE STANDARDS

A. ASTM C635/C635M - Standard Specification for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings 2022.

B. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels 2019.

C. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions 2022.

D. ASTM E1264 - Standard Classification for Acoustical Ceiling Products 2022.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.

B. Do not install acoustical units until after interior wet work is dry.

1.05 SUBMITTALS

A. See Section 01 3001 - Submittals for Submittal procedures.

B. Product Data: Provide data on suspension system components and acoustical units.

C. Samples: Submit two samples in size illustrating material and finish of acoustical units.

D. Samples: Submit two samples each, long, of suspension system main runner, cross runner, and perimeter molding.

E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

F. Sustainability Submittals, Product data for HPSB Compliance:

1. For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content.

   a. Include statement indicating costs (sell price for each product having recycled content)

   b. Include total weight of products provided

2. For products having Biologically Based Products, documentation indicating percentages of Biologically-Based Products

3. For products containing VOCs, documentation (material safety data sheets (MSDS), third-party certificates, or test reports) showing printed statement of VOC content.

4. VOC Content Limitations: For the specified products, submit documentation of conformance with Specification Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

G. Maintenance Materials: Furnish the following for the Owner's use in maintenance of project.

1. See Section 016000 - Product Requirements, for additional provisions.

1.06 QUALITY ASSURANCE

A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

B. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.07 FIELD CONDITIONS

A. Maintain uniform temperature of minimum 60 degrees F (16 degrees C), and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

1.08 SUSTAINABILITY REQUIREMENTS

A. Contractor shall endeavor to provide materials with a high recycled content:

1. See Part 2 of this specification section for specific recycled content thresholds, if applicable.

B. Contractor shall endeavor to provide materials with a high Biobased content where possible.

1. See Part 2 of this specification section for specific biobased content thresholds, if applicable.

C. Contractor shall endeavor to provide materials with the lowest possible VOC content.

PART 2 PRODUCTS

2.01 ACOUSTICAL UNITS

A. Acoustical Tile Type ACT1: Type IV, Form 2, Pattern E, Fine textured and painted mineral fiber, with to the following characteristics:

1. VOC Content: Certified as Low Emission by one of the following :

a. GreenGuard Gold Certified; www.greenguard.org.

2. Size: 24 x 24 inches

3. Thickness: 7/8" inches (22 mm).

4. Composition: Mineral Fiber.
5. Noise Reduction Coefficient (NRC): [.80] determined as specified in ASTM C 423.
6. Ceiling Attenuation Class (CAC): 35, determined as specified in ASTM C 1414.
7. Edge Profile: Beveled Tegular lay-in for interface with compatible grid.
8. Surface Color: White.
9. Surface Texture: Fine.
10. Flame Spread: ASTM E 1264; Class A (UL).
11. Suspension System: Type 1.
12. Recycled Content: 76%
13. Biobased Content: For ACT1: Minimum Biobased content per USDA: 95%
14. Warranty: 30 Year Limited Systtem Warranty

B. Acoustical Tile, Type ACT2: Vinyl faced gypsum panels, with the following characteristics:

1. Size: 24 x 24 inches.
2. Thickness: 5/8 inches (15.9 mm).
3. Light Reflectance: 77%, determined in accordance with ASTM E1264
4. Edge: Square.
5. Surface Color: White.
6. CAC: 35
7. Type: XX, mineral base with membrane faced overlay
8. Recycled Content: 80%.
9. VOC Emissions: Third party (GREENGUARD Gold) certified for low-emitting performance, meets California Department of Department of Public Health's (CDPH) Standard Method v1.1-2010 (CA Section 01350). 'Certificates of Compliance' for Low VOC Emissions are available on usg.com and at productguide.ulenvironment.com.

10. Panel Features: Washable, scrubbable, soil and impact resistant finish. Meets USDA/FSIS guidelines for use in food processing areas.

11. USDA Certified Biobased Product: 95%

12. Suspension System: Exposed Grid Type I

13. Warranty: 30 Year Limited System Warranty

2.02 SUSPENSION SYSTEM(S)

A. Manufacturers:

1. Same as for acoustical units.

B. Metal Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with perimeter moldings, hold down clips, stabilizer bars, clips, and splices as required.

C. Metal Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with perimeter moldings, hold down clips, stabilizer bars, clips, and splices as required.

D. Suspension System Type 1: Formed steel, commercial quality cold rolled; intermediate-duty.

1. Profile: Tee; 15/16 inch (24 mm)

2. Finish: White painted.

3. Recycled Content: 61%

2.03 ACCESSORIES

A. Support Channels and Hangers: Galvanized steel; size and type to suit application and ceiling system flatness requirement specified.

B. Hanger Wire: 12-gage 0.08 inch (2 mm) galvanized steel wire.

C. Perimeter Moldings: Same metal and finish as grid.

1. At Exposed Grid: Provide L-shaped molding for mounting at same elevation as face of grid.

D. Gypsum Board: Fire rated type; 5/8 inch (16 mm) thick, ends and edges square, paper faced.

E. Touch-up Paint: Type and color to match acoustical and grid units.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Coordinate with all adjacent trades.

C. Verify that layout of hangers will not interfere with other work.

3.02 INSTALLATION - SUSPENSION SYSTEM

A. Install suspension system in accordance with ASTM C 636/C 636M, ASTM E 580/E 580M, ASTM C 636/C 636M, ASTM E 580/E 580M, ASTM C 636/C 636M, and ASTM E 580/E 580M and as supplemented in this section.

B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.

C. Locate system on room axis according to reflected plan.

D. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.

1. Use longest practical lengths.

E. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.

F. Suspension System, Non-Seismic: Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.

G. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.

1. Space hangers at not more than 48" on center and within 6" of ends of each direct hung runner or carrying channel, unless indicated otherwise.

H. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.

I. Support fixture loads using supplementary hangers located within 6 inches (152 mm) of each corner, or support components independently.

J. Do not eccentrically load system or induce rotation of runners.

K. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.

1. Use longest practical lengths.

2. Overlap and rivet corners.

L. Form expansion joints as detailed. Form to accommodate plus or minus 1 inch (25 mm) movement. Maintain visual closure.

3.03 INSTALLATION - ACOUSTICAL UNITS

A. Install acoustical units in accordance with manufacturer's instructions.

B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.

C. Fit border trim neatly against abutting surfaces.

D. Install units after above-ceiling work is complete.

E. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.

F. Cutting Acoustical Units:

1. Make field cut edges of same profile as factory edges.

G. Where round obstructions occur, provide preformed closures to match perimeter molding.

H. Where incandescent light fixtures, exit signs, smoke detectors, signal lights, occur, glue 5/8" sheathing board to the top side of the tile receiving the device.

I. Install hold-down clips on panels within 20 ft (6 m) of an exterior door.

3.04 TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet (3 mm in 3 m).

B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION

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SECTION 096500 - RESILIENT BASE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Resilient base.

B. Installation accessories.

C. Materials included in this section shall meet the requirements for High Performance Sustainable Buildings for New Construction points for the following Sections:

1. 2-5.3.2 - Reduce Volatile Organic Compounds (VOC) Low-Emitting Materials

2. The contractor is expected to understand the HPSB requirements for these sections and include all applicable overhead in their base bid for the necessary documentation to achieve the above listed credits.

1.02 RELATED REQUIREMENTS

A. Section 01 3325 - Project Sustainability Summary

B. Section 01 3329 - Sustainable Design Reporting

C. Section 01 6000 - Product Requirements

D. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions

E. Section 01 7419 - Construction Waste Management and Disposal

F. Section 033000 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors.

G. Section 090561 - Common Work Results for Flooring Preparation: Independent agency testing of concrete slabs, removal of existing floor coverings, cleaning, and preparation.

1.03 REFERENCE STANDARDS

A. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source 2019a, with Editorial Revision (2020).

B. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring 2022.

C. ASTM F1861 - Standard Specification for Resilient Wall Base 2021.

D. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source 2023.

1.04 SUBMITTALS

A. See Section 01 3001 - Submittals for Submittal procedures.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.

C. Selection Samples: Submit manufacturer's complete set of color samples for the Architect's initial selection.

D. Sustainability Submittals, Product data for HPSB Compliance:

1. For products containing VOCs, documentation (material safety data sheets (MSDS), third-party certificates, or test reports) showing printed statement of VOC content.

2. VOC Content Limitations: For the specified products, submit documentation of conformance with Specification Section 01 6116 – Volatile Organic Compound (VOC) Content Restrictions.

E. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

1. Extra Stair Materials: Quantity equivalent to 5 percent of each type and color.

1.05 QUALITY ASSURANCE

A. Installer must be licensed, insured and have three years documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Maintain temperature in storage area between 55 degrees F (13 degrees C) and 90 degrees F (72 degrees C).

B. Protect roll materials from damage by storing on end.

1.07 FIELD CONDITIONS

A. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F (21 degrees C) to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F (13 degrees C).

1.08 WARRANTY

A. Provide manufacturer's limited commercial warranty.

1.09 SUSTAINABILITY REQUIREMENTS

A. Contractor shall endeavor to provide materials with the lowest possible VOC content.

PART 2 PRODUCTS

2.01 RESILIENT BASE

A. Resilient Base: Basis of Design: Type TS rubber, vulcanized thermoset; top set Style B, Cove

1. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with NFPA 253, ASTM E 648, ASTM E 648, or NFPA 253.
2. Height: 4 inch (100 mm)
3. Thickness: 1/8" inch (3 mm) thick.
4. Finish: Satin.
5. Length: Roll.
6. Color: As indicated on drawings.
7. Accessories: Premolded external corners and end stops.

2.02 ACCESSORIES

A. Primers, Adhesives, and Seaming Materials: Waterproof; types recommended by flooring manufacturer to suit floor tile and substrate conditions on site.

1. Comply with VOC restrictions specified in 01 6116

B. Moldings, Transition and Edge Strips: as indicated on the drawings..

C. Sealer and Wax: Types recommended by flooring manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive resilient base.

C. Verify that concrete sub-floor surfaces are dry enough and ready for resilient flooring installation by testing for moisture emission rate and alkalinity in accordance with ASTM F710; obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.

3.02 INSTALLATION

A. Starting installation constitutes acceptance of sub-surface conditions.

B. Install in accordance with manufacturer's written instructions.

C. Spread only enough adhesive to permit installation of materials before initial set.

D. Fit joints and butt seams tightly.

3.03 RESILIENT BASE

A. Miter internal corners. At external corners, use premolded units. At exposed ends, use premolded units.

B. Install base on solid backing. Bond tightly to wall and floor surfaces.

C. Apply wall base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

D. Scribe and fit to door frames and other interruptions.

E. Tightly adhere wall base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

F. Install wall base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned. Fit joints tightly and make vertical.

G. Install premolded corners before installing straight pieces.

H. Job-Formed Corners:

1. Inside Corners: Use straight pieces of maximum lengths possible. Form by cutting an inverted V-shaped notch in toe of wall base at the point where corner is formed. Shave back of base where necessary to produce a snug fit to substrate.

3.04 CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces without damage.

B. Clean in accordance with manufacturer's written instructions.

3.05 PROTECTION

A. Perform the following operations immediately after completing floor tile installation:

1. Remove wet adhesive and other blemishes from exposed surfaces with a damp cloth.

END OF SECTION

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SECTION 099113 - EXTERIOR PAINTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints.

C. Scope: Finish exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:

1. Exposed surfaces of steel lintels and ledge angles.

D. Do Not Paint or Finish the Following Items:

1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
2. Items indicated to receive other finishes.
3. Items indicated to remain unfinished.
4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
5. Non-metallic roofing and flashing.
6. Stainless steel, anodized aluminum, bronze, terne coated stainless steel, zinc, and lead.
7. Marble, granite, slate, and other natural stones.
8. Floors, unless specifically indicated.
9. Ceramic and other types of tiles.
10. Brick, glass unit masonry, architectural concrete, cast stone, integrally colored plaster and stucco.
11. Glass.
12. Concealed pipes, ducts, and conduits.

1.02 RELATED REQUIREMENTS

A. Section 016116 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 055000 - Metal Fabrications: Shop-primed items.

C. Section 099123 - Interior Painting.

1.03 DEFINITIONS

A. Comply with ASTM D16 for interpretation of terms used in this section.

1.04 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency current edition.

B. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications 2019.

C. MPI (APL) - Master Painters Institute Approved Products List; Master Painters and Decorators Association Current Edition.

D. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual Current Edition.

E. SSPC V1 (PM1) - Good Painting Practice: Painting Manual Volume 1 2016.

F. SSPC-SP 1 - Solvent Cleaning 2015, with Editorial Revision (2016).

G. SSPC-SP 6 - Commercial Blast Cleaning 2007.

1.05 SUBMITTALS

A. See Section 01 3001 - Submittals, for submittal procedures.

B. Product Data: Provide complete list of products to be used, with the following information for each:

1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").

2. MPI product number (e.g. MPI #47).

3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.

4. Manufacturer's installation instructions.

5. If proposal of substitutions is allowed under submittal procedures, explanation of substitutions proposed.

C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches (216 by 279 mm) in size, illustrating range of colors available for each finishing product specified.

1. Where sheen is specified, submit samples in only that sheen.

2. Where sheen is not specified, discuss sheen options with the Contracting Officer Representative before preparing samples, to eliminate sheens definitely not required.

3. Paint color submittals will not be considered until color submittals for major materials not to be painted, such as masonry, have been approved.

D. Certification: By manufacturer that paints and finishes comply with VOC limits specified.

E. Manufacturer's Instructions: Indicate special surface preparation procedures.

F. Maintenance Data: Submit data including finish schedule showing where each product/color/finish was used, product technical data sheets, material safety data sheets (MSDS), care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and color samples of each color and finish used.

G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

1. See Section 016000 - Product Requirements, for additional provisions.

2. Extra Paint and Finish Materials: 1 gallon (4 L) of each color; from the same product run, store where directed.

3. Label each container with color in addition to the manufacturer's label.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum 3 years experience and approved by manufacturer.

1.07 MOCK-UP

A. See Section 014000 - Quality Requirements, for general requirements for mock-up.

B. Provide panel, 10 feet (3 m) long by 10 feet (3 m) wide, illustrating paint color, texture, and finish.

C. Provide door and frame assembly illustrating paint color, texture, and finish.

D. Locate where directed by the Government.

E. Mock-up may remain as part of the work.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.

1.09 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Do not apply exterior paint and finishes during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.

D. Minimum Application Temperatures for Latex Paints: 50 degrees F (10 degrees C) for exterior; unless required otherwise by manufacturer's instructions.

E. Provide lighting level of 80 ft candles (860 lx) measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide paints and finishes used in any individual system from the same manufacturer; no exceptions.

B. Primer Sealers: Same manufacturer as top coats.

2.02 PAINTS AND FINISHES - GENERAL

A. Paints and Finishes: Ready mixed, unless required to be a field-catalyzed paint.

1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.

2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

3. Supply each paint material in quantity required to complete entire project's work from a single production run.

4. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.

B. Volatile Organic Compound (VOC) Content: Comply with Section 016116.

C. Flammability: Comply with applicable code for surface burning characteristics.

D. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by the Architect from the manufacturer's full line.

E. Colors: As indicated on drawings.

2.03 PAINT SYSTEMS - EXTERIOR

A. Paint CE-OP-3L - Masonry (CMU), Opaque, Latex, 3 Coat:

1. One coat of block filler; MPI #4: 16.0-21.0 mils wet; 8.0-10.5 dft., 50+/- 2% volume solids, <50 g/l VOC, passes Wind Driven Rain test method TT-C-555b

2. Semi-gloss: Two coats of latex enamel; MPI #11: 4.0 mils wet; 1.6 mils dft., 39 +/- 2% volume solids, <50 g/l VOC

B. Paint ME-OP-3A - Ferrous Metals, Unprimed, Alkyd, 3 Coat:

1. One coat of alkyd primer; MPI #79: 6.0-8.0 mils wet; 3.3-4.4 mils dft, 55 +/- 2% volume solids, <390 g/l VOC

2. Gloss: Two coats of alkyd enamel; MPI#9: 4.0-6.0 mils wet, 1.9-5.0 mils dft, 63 +/- 2% volumes solids, < 420 g/l VOC

C. Paint MgE-OP-3A - Galvanized Metals, Alkyd, 3 Coat:

1. One coat galvanize primer

2. Gloss: Two coats of alkyd enamel;

a. MPI #79: 6.0-8.0 mils wet; 3.3-4.4 mils dft, 55 +/- 2% volume solids, <390 g/l VOC

b. MPI #76: 3.0-8.0 mils wet; 1.9-5.0 mils dft, 63 +/- 2% volume solids, <320 g/l VOC

2.04 PRIMERS

A. Primers: Provide the following unless other primer is required or recommended by manufacturer of top coats.

1. Concrete Masonry: Interior/Exterior Latex Block Filler.

2. Steel, Uncoated: Anti-Corrosive Alkyd Primer for Metal.

3. Steel --Shop Primer: Interior/Exterior Quick Dry Alkyd Primer for Metal.

4. Galvanized Steel: Water Based Primer for Galvanized Metal.

5. Wood: Latex Primer for Exterior Wood.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin application of paints and finishes until substrates have been properly prepared.

B. Commencement of paint operations indicates applicators acceptance of surfaces and conditions.

C. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

D. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.

E. Test shop-applied primer for compatibility with subsequent cover materials.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or repair existing paints or finishes that exhibit surface defects.

D. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces for finishing.

E. Seal surfaces that might cause bleed through or staining of topcoat.

F. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

G. Galvanized Surfaces:

1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.

H. Ferrous Metal:

1. Solvent clean according to SSPC-SP 1.

2. Remove rust, loose mill scale, and other foreign substances using using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 "Commercial Blast Cleaning". Protect from corrosion until coated.

3.03 APPLICATION

A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

B. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".

C. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.

D. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

E. Apply each coat to uniform appearance.

F. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply additional coats until complete hide is achieved.

G. Sand wood and metal surfaces lightly between coats to achieve required finish.

H. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

I. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements, for general requirements for field inspection.

3.05 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.06 PROTECTION

A. Protect finishes until completion of project.

B. Touch-up damaged finishes after Beneficial Occupancy.

END OF SECTION

SECTION 099123 - INTERIOR PAINTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints.

C. Scope: Finish interior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.

1. Prime surfaces to receive wall coverings.

2. Mechanical and Electrical:

a. In finished areas, paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment, and electrical equipment, unless otherwise indicated.

b. In finished areas, paint shop-primed items.

c. Paint interior surfaces of air ducts and convector and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat black paint to visible surfaces.

D. Do Not Paint or Finish the Following Items:

1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.

2. Items indicated to receive other finishes.

3. Items indicated to remain unfinished.

4. Fire rating labels, equipment serial number and capacity labels, bar code labels, and operating parts of equipment.

5. Stainless steel, anodized aluminum, bronze, terne coated stainless steel, and lead items.

6. Marble, granite, slate, and other natural stones.

7. Floors, unless specifically indicated.

8. Ceramic and other tiles.

9. Brick, architectural concrete, cast stone, integrally colored plaster and stucco.
10. Exterior insulation and finish system (EIFS).
11. Electrical devices and plates.
12. Door hardware and cabinet hardware.
13. Glass.
14. Toilet accessories and toilet partitions.
15. Concrete masonry units in utility, mechanical, and electrical spaces.
16. Acoustical materials, unless specifically indicated.
17. Concealed pipes, ducts, and conduits.

E. Materials included in this section shall meet the requirements for High Performance Sustainable Buildings for New Construction points for the following Sections:

1. 2-5.3.2 - Reduce Volatile Organic Compounds (VOC) Low-Emitting Materials
2. The contractor is expected to understand the HPSB requirements for these sections and include all applicable overhead in their base bid for the necessary documentation to achieve the above listed credits.

1.02 RELATED REQUIREMENTS

A. Section 01 3325 - Project Sustainability Summary

B. Section 01 3329 - Sustainable Design Reporting

C. Section 01 6000 - Product Requirements

D. Section 016116 - Volatile Organic Compound (VOC) Content Restrictions.

E. Section 055000 - Metal Fabrications: Shop-primed items.

F. Section 08 1113 - Hollow Metal Doors and Frames

G. Section 099113 - Exterior Painting.

1.03 DEFINITIONS

A. Comply with ASTM D16 for interpretation of terms used in this section.

1.04 REFERENCE STANDARDS

A. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications 2019.

B. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials 2020.

C. MPI (APL) - Master Painters Institute Approved Products List; Master Painters and Decorators Association Current Edition.

D. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual Current Edition.

E. SSPC-SP 1 - Solvent Cleaning 2015, with Editorial Revision (2016).

F. SSPC-SP 6 - Commercial Blast Cleaning 2007.

G. SSPC-SP 13 - Surface Preparation of Concrete 2018.

1.05 SUBMITTALS

A. See Section 01 3001 - Submittals for submittal procedures.

B. Product Data: Provide complete list of products to be used, with the following information for each:

1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").

2. Cross-reference to specified paint system(s) product is to be used in; include description of each system.

3. Manufacturer's installation instructions.

4. If proposal of substitutions is allowed under submittal procedures, explanation of substitutions proposed.

C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches (216 by 279 mm) in size, illustrating range of colors available for each finishing product specified.

1. Where sheen is specified, submit samples in only that sheen.

2. Where sheen is not specified, discuss sheen options with Contracting Officer Representative before preparing samples, to eliminate sheens definitely not required.

3. Paint color submittals will not be considered until color submittals for major materials not to be painted, such as masonry, have been approved.

D. Certification: By manufacturer that paints and finishes comply with VOC limits specified.

E. Manufacturer's Instructions: Indicate special surface preparation procedures.

F. Sustainability Submittals, Product data for HPSB Compliance:

1. For products containing VOCs, documentation (material safety data sheets (MSDS), third-party certificates, or test reports) showing printed statement of VOC content.

2. VOC Content Limitations: For the specified products, submit documentation of conformance with Specification Section 01 6116 – Volatile Organic Compound (VOC) Content Restrictions.

G. Maintenance Data: Submit data including finish schedule showing where each product/color/finish was used, product technical data sheets, material safety data sheets (MSDS), care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and color samples of each color and finish used.

H. Maintenance Materials: Furnish the following for the Owner's use in maintenance of project.

1. See Section 016000 - Product Requirements, for additional provisions.

2. Extra Paint and Finish Materials: 1 gallon (4 L) of each color; from the same product run, store where directed.

3. Label each container with color in addition to the manufacturer's label.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum 3 years experience and approved by manufacturer.

1.07 MOCK-UP

A. See Section 014000 - Quality Requirements, for general requirements for mock-up.

B. Provide panel, 10 feet (3 m) long by 10 feet (3 m) wide, illustrating paint color, texture, and finish.

C. Provide door and frame assembly illustrating paint color, texture, and finish.

D. Locate where directed by the Government.

E. Mock-up may remain as part of the work.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.

1.09 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

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

D. Minimum Application Temperatures for Paints: 50 degrees F (10 degrees C) for interiors unless required otherwise by manufacturer's instructions.

E. Provide lighting level of 80 ft candles (860 lx) measured mid-height at substrate surface.

1.10 SUSTAINABILITY REQUIREMENTS

A. Contractor shall endeavor to provide materials with the lowest possible VOC content.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide paints and finishes used in any individual system from the same manufacturer; no exceptions. Paint Manufacturer must be listed as an MPI approved company.

B. Primer Sealers: Same manufacturer as top coats.

C. Block Fillers: Same manufacturer as top coats.

D. Substitutions: See Section 016000 - Product Requirements.

2.02 PAINTS AND FINISHES - GENERAL

A. Paints and Finishes: Ready mixed, unless intended to be a field-catalyzed paint.

1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.

2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

3. Supply each paint material in quantity required to complete entire project's work from a single production run.

4. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.

B. Volatile Organic Compound (VOC) Content: Comply with Section 016116.

C. Flammability: Comply with applicable code for surface burning characteristics.

D. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by the Architect from the manufacturer's full line.

E. Colors: As indicated on drawings.

1. In finished areas, finish pipes, ducts, conduit, and equipment the same color as the wall/ceiling they are mounted on/under or as indicated on drawings.

2.03 PAINT SYSTEMS - INTERIOR

A. Paint I-OP - Interior Surfaces to be Painted, Unless Otherwise Indicated: Including gypsum board, concrete, concrete masonry units, wood, plaster, uncoated steel, and shop primed steel.

1. Two top coats and one coat primer.

2. Top Coat Sheen:

a. Flat: MPI gloss level 1; use this sheen for ceilings and other overhead surfaces.

b. Eggshell: MPI gloss level 3; use this sheen at all locations.

c. Satin: MPI gloss level 4; use this sheen for items subject to frequent touching by occupants, including door frames and railings.

d. Semi-Gloss: MPI gloss level 5; use this sheen at opaque wood and metal..

3. Primer: As recommended by top coat manufacturer for specific substrate.

B. Paint I-OP-DF - Dry Fall: Metals; exposed structure and overhead-mounted services in utilitarian spaces, including shop primed steel deck, structural steel, metal fabrications, galvanized ducts, galvanized conduit, and galvanized piping.

1. Shop primer as recommended by manufacturer of top coat.

2. Finish:

a. MPI #118, Flat (<50 g/l voc) (25%+ volume solids)

b. MPI #155, EgShel (<50 g/l voc) (33%+ volume solids)

C. Paint I-TR-C - Transparent Finish on Concrete Floors.

1. 2 coats sealer.

2. Sealer: Water Based for Concrete Floors.

a. Products:

1) MPI #31 (<300 g/l voc) (68% +/- 2% volume solids) (passed ASTM D4060)

2) or MPI #83 (<300 g/l voc) (68% +/- 2% volume solids) (passed ASTM D4060)

3) Provide 2 coats installed in strict accordance of manufacturer.

4) Test in accordance with ASTM F710 prior to installation to verify complicance with manufacturer.

5) Provide surface preparation and application per manufacturer's recommendations.

D. Paint CI-OP-3L - Concrete/Masonry, Opaque, Latex, 3 Coat:

1. One coat of block filler equal to SW B25W00025 PrepRite Block Filler White.

2. One coat of block filler: (16.0 - 21.0 mils wet; 8.0 – 10.5 mils dry)

   a. MPI #4 – CMU (<50 g/l voc) (50% +/- 2% volume solids)

3. One coat of masonry primer (5.0 - 12.0 mils wet; 2.1 – 5.1 mils dry)

   a. MPI #3 – Smooth Masonry (50 g/l voc) (43% +/- 2% volume solids)

4. Semi-gloss: Two coats of latex enamel:

   a. MPI #141 or MPI #141X (<50 g/l voc) (35% +/- 2% volume solids) (pass scrub resistance test: ASTM D2486)

E. Paint MI-OP-3L - Ferrous Metals, Unprimed, Latex, 3 Coat:

1. One coat of latex primer

   a. MPI #107, MPI #107X, MPI #134 (50 g/l voc) (38% +/- 2%) (5.0 – 10.0 mils wet)

2. Semi-gloss: Two coats of latex enamel:

   a. MPI #140, MPI #140X (<50 g/l voc) (35% +/- 2%) (6.0 – 12.0 mils wet)

F. Paint MgI-OP-3L - Galvanized Metals, Latex, 3 Coat:

1. One coat galvanize primer:

   a. MPI #107. MPI #107X, MPI #134 (50 g/l voc) (38% +/- 2%) (5.0 – 10.0 mils wet)

2. Gloss: Two coats of latex enamel:

   a. MPI #148, MPI #148X (<50% +/- 2%) (6.0 – 12.0 mils wet)

G. Paint GI-OP-3L - Gypsum Board/Plaster, Latex, 3 Coat:

1. One coat of latex primer sealer:

   a. MPI #149, MPI #149X (<50 g/l voc) (26% +/- 2%)

2. Eggshell: Two coats of latex enamel; equal to SW B20W2651 ProMar 200 Zero VOC Eggshell.

3. Eggshell: Two coats of Acrylic enamel:

   a. MPI #139, MPI #139X, MPI #145, MPI #145X (<50 g/l voc) (42% +/- 2%)

2.04 PRIMERS

A. Primers: Provide the following unless other primer is required or recommended by manufacturer of top coats. Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

1. Concrete/Plaster: Interior Institutional Low Odor/VOC Primer Sealer; MPI #149.

2. Concrete Masonry: Interior/Exterior Latex Block Filler; MPI #4.

3. Gypsum Board/Plaster: Interior Latex Primer Sealer; MPI #50.

4. Steel: Anti-Corrosive Alkyd Primer for Metal; MPI #79.

5. Steel --Shop Primer: Interior/Exterior Quick Dry Alkyd Primer for Metal; MPI #76.

6. Galvanized Steel: Interior Water Based Primer for Galvanized Metal; MPI #134.

7. Wood: Latex Primer for Interior Wood; MPI #39.

2.05 ACCESSORY MATERIALS

A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin application of paints and finishes until substrates have been properly prepared.

B. Commencement of paint operations indicates applicators acceptance of surfaces and conditions.

C. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

D. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.

E. Test shop-applied primer for compatibility with subsequent cover materials.

F. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:

1. Gypsum Wallboard: 12 percent.
2. Plaster and Stucco: 12 percent.
3. Masonry, Concrete, and Concrete Masonry Units: 12 percent.
4. Interior Wood: 15 percent, measured in accordance with ASTM D4442.
5. Concrete Floors and Traffic Surfaces: 8 percent.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or repair existing paints or finishes that exhibit surface defects.

D. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.

E. Seal surfaces that might cause bleed through or staining of topcoat.

F. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

G. Concrete:

1. 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.

2. Prepare surface as recommended by top coat manufacturer and according to SSPC-SP 13.

H. Masonry:

1. Remove efflorescence and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces or if alkalinity of mortar joints exceed that permitted in manufacturer's written instructions. Allow to dry.

2. Prepare surface as recommended by top coat manufacturer.

I. Concrete Floors and Traffic Surfaces: Remove contamination, acid etch, and rinse floors with clear water. Verify required acid-alkali balance is achieved. Allow to dry.

J. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.

K. Galvanized Surfaces:

1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.

L. Ferrous Metal:

1. Solvent clean according to SSPC-SP 1.

2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.

3. Remove rust, loose mill scale, and other foreign substances using using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 "Commercial Blast Cleaning". Protect from corrosion until coated.

M. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.03 APPLICATION

A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

B. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".

C. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.

D. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

E. Apply each coat to uniform appearance in thicknesses specified by manufacturer.

F. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.

G. Sand wood and metal surfaces lightly between coats to achieve required finish.

H. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

I. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements, for general requirements for field inspection.

3.05 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.06 PROTECTION

A. Protect finishes until completion of project.

B. Touch-up damaged finishes after Beneficial Occupancy.

END OF SECTION

SECTION 099600 - HIGH-PERFORMANCE COATINGS

PART 1 GENERAL

1.01 1.01 SECTION INCLUDES

A. High performance coatings where noted on the drawings.

B. Special preparation of surfaces.

C. Materials included in this section shall meet the requirements for High Performance Sustainable Buildings for New Construction points for the following Sections:

1. 2-5.3.2 - Reduce Volatile Organic Compounds (VOC) Low-Emitting Materials

2. The contractor is expected to understand the HPSB requirements for these sections and include all applicable overhead in their base bid for the necessary documentation to achieve the above listed credits.

1.02 RELATED REQUIREMENTS

A. Section 01 2300 - Bid Options.

B. Section 01 3325 - Project Sustainability Summary

C. Section 01 3329 - Sustainable Design Reporting

D. Section 01 6000 - Product Requirements

E. Section 01 7419 - Construction Waste Management and Disposal

F. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

G. Section 09 9000 - Painting and Coating.

1.03 REFERENCE STANDARDS

A. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2010.

B. SSPC-SP 2 - Hand Tool Cleaning; Society for Protective Coatings; 1982 (Ed. 2004).

C. SSPC-SP 3 - Power Tool Cleaning; Society for Protective Coatings; 1982 (Ed. 2004).

D. ASTM Standards

1. ASTM C 307 - Standard Test Method for Tensile Strength of Chemical-Resistant Mortar, Grouts, and Monolithic Surfacings.
2. ASTM C 579 - Standard Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes.
3. ASTM C 580 - Standard Test Method for Flexural Strength and Modulus of Elasticity of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes.
4. ASTM D 635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position.
5. ASTM D 3960 - Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings.
6. ASTM D 4226 - Standard Test Methods for Impact Resistance of Rigid Poly(Vinyl Chloride) (PVC) Building Products.
7. ASTM D 4541 - Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers.
8. ASTM F 1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
9. ASTM F 2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.
10. ASTM G 21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.

E. National Floor Safety Institute (NFSI)

1. ANSI/NFSI B101.1 - Test Method for Measuring Wet SCOF of Common Hard-Surface Floor Materials.

1.04 SUBMITTALS

A. See Section 01 3001 - Submittals for Submittal procedures.

B. Product Data:

1. Manufacturer's data sheets on each product to be used, including properties, VOC content, wet static coefficient of friction, compressive strength, tensile strength, elongation and similar properties.

2. Preparation instructions and recommendations.

3. Storage and handling requirements and recommendations.

4. Typical installation methods.

C. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention, and recommended cleaning procedures for preparing existing concrete floor slabs to receive new coating. .

D. Sample: Provide 12" x 12" sample of proposed epoxy floor finish to the Government for approval of color and gloss level.

E. Maintenance Data: Include cleaning procedures and repair and patching techniques.

F. Maintenance Materials: Furnish the following for the Government's use in maintenance of project.

1. Extra Coating Materials: 1 gallon (4 liters) of each type and color.

2. Label each container with manufacturer's name, product number, color number, and room names and numbers where used.

G. Sustainability Submittals, Product data for HPSB Compliance:

1. For products containing VOCs, documentation (material safety data sheets (MSDS), third-party certificates, or test reports) showing printed statement of VOC content.

2. VOC Content Limitations: For the specified products, submit documentation of conformance with Specification Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

1.05 QUALITY ASSURANCE

A. Maintain one copy of each referenced document that applies to application on site.

B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

C. Applicator Qualifications: Company specializing in performing the work of this section with minimum 3 years documented experience.

D. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.

1.06 MOCK-UP

A. Provide mock-up, 10 feet long by 10 feet wide, illustrating color and sheen for each specified coating.

B. Locate where directed.

C. Mock-up may remain as part of the Work.

1.07 FIELD CONDITIONS

A. Apply flooring system under the following ambient conditions.

1. Ambient and Concrete Floor Temperatures: Between 40 and 85 degrees F (4 and 29 degrees C).

2. Material Temperature: Between 50 and 80 degrees F (10 and 27 degrees C).

3. Relative Humidity: Maximum 80 percent.

4. Dew Point: Floor temperature more than 5 degrees over dew point.

B. Provide lighting level of 80 ft candles (860 lx) measured mid-height at substrate surface.

C. Restrict traffic from area where coating is being applied or is curing.

D. Do not apply flooring system under ambient conditions outside manufacturer's limits.

1.08 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a five year period after Date of Beneficial Occupancy.

C. Warranty: Include coverage for bond to substrate and degradation of chemical resistance.

PART 2 PRODUCTS

2.01 HIGH-PERFORMANCE COATINGS

A. Provide coating systems that meet the following minimum performance criteria, unless more stringent criteria are specified:

1. Abrasion Resistance: 18 mg loss, when tested in accordance with ASTM D4060.

B. Moderate Exposure: All minimum criteria, plus:

2.02 MATERIALS

A. Coatings - General: Provide complete multi-coat systems formulated and recommended by manufacturer for the applications indicated, in the thicknesses indicated; number of coats specified does not include primer or filler coat.

B. Polyurethane Floor Coating: Three coats, moisture cure polyurethane, non-skid finish, matte finish.

1. Product characteristics:

a. Percentage of solids by weight (ASTM D2369): 99.35 - Part A; 59.23 - Part B, 100 - Part C, minimum.

b. Dry film thickness, per coat: 3.0, minimum.

c. VOC Content per ASTM D3960 (Mixed): 86 g/L maximum A+B+C

d. Abrasion Resistance: mg loss ASTM D4060 = 18.0

e. Coefficient of Friction ASTM D2047 = 0.63

f. Tension Strength (psi) Resin Only - ASTM C2370= 6,250

2. Chemical Resistance Properties:

a. Product shall have excellent resistant (in both 1 day and 7 day tests) to the following materials:

1) Acids (Inorganic): 10% Hydrochloric Acid, 30% Hydrochloric Acid, 10% Nitric Acid, 37% Sulfuric Acid,

2) Acids (Organic): 10% Acetic Acid, 10% Citric Acid, Oleic Acid,

3) Alkalies: 10% Ammonium Hydroxide, 50% Sodium Hydroxide,

4) Solvents(Alcohols): Ethylene Glycol (Antifreeze), Isopropyl Alcohol, Methanol

5) Solvents (Aliphatic:) d-Limonene, Jet Fuel (JP-4), Gasoline, Mineral Spirits

6) Solvents (Aromatic) Xylene

7) Solvents (Ketones & Esters): Methyl Ethyl Ketone, Propylene Glycol Methyl, Ether Acetate

8) Miscellaneous: 20% Ammonium Nitrate, Chemicals Brake Fluid, Bleach, Motor Oil (SAE30), Skydrol® 500B, Skydrol® LD4, 20% Sodium Chloride, 1% Tide® Laundry Soap, 10% Trisodium Phosphate

3. Primer for concrete: Two component epoxy primer as recommended by the coating manufacturer.

4. Colorant: Provide manufacturer's standard colorant for selected finished color.

5. Traction Grit: Provide aluminum oxide grit materials as recommended by the manufacturer.

6. Cleaners & Related Products: Provide Industrial Grease Remover, detergents, cleaners, and etchants as recommended by the manufacturer for applications indicated on the contract documents.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine concrete surfaces to receive flooring system. Verify concrete is structurally sound.

B. Moisture Testing of Concrete: Perform at least one of the following two tests to determine moisture in concrete. Type of test and frequency as recommended by manufacturer and installer.

1. Calcium Chloride Test:

a. Measure moisture vapor emission rate of concrete in accordance with ASTM F 1869.

b. Application of flooring system shall start only if test results are below 12 pounds per 1,000 sq.ft (1.5kg/93 sq.m) over a 24-hour period.

c. If test results are above limits, notify Architect and flooring manufacturer in writing.

2. In-situ Probe Test:

a. Measure relative humidity in concrete in accordance with ASTM F 2170.

b. Application of flooring system shall start only if test results are below 85 percent relative concrete humidity.

c. If test results are above limits, notify Architect and flooring manufacturer in writing.

C. Do not begin preparation or installation until satisfactory moisture test results are achieved. Provide flooring manufacturer's recommended moisture vapor control coating if required.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Protection of In-Place Conditions: Protect adjacent surfaces and adjoining walls from contact with flooring system materials.

C. Surface Preparation:

1. Prepare concrete surface in accordance with manufacturer’s instructions.

2. Remove dirt, dust, debris, oil, grease, curing agents, bond breakers, paint, coatings, sealers, silicones, and other surface contaminants which could adversely affect application of flooring system.

3. Steel shot blast concrete to a minimum surface profile of ICRI 310.2R, CSP 5.

4. Key-cut termination points with 1/4-inch (6-mm) by 1/4-inch (6-mm) cut.

5. Patch depressions, divots, and cracks in concrete in accordance with manufacturer’s instructions.

6. Mechanically remove loose, delaminated, and damaged concrete and repair in accordance with manufacturer’s instructions.

7. Joints: Fill joints in accordance with manufacturer’s instructions.

3.03 INSTALLATION

A. Install flooring system in accordance with manufacturer’s instructions and approved submittals at locations indicated on the Drawings.

B. Ensure concrete is dry, clean, and prepared in accordance with manufacturer’s instructions.

C. Allow concrete to cure a minimum of 7 days before applying flooring system.

D. Mixing:

1. Mix material components together in accordance with manufacturer's instructions.

2. Mix only enough material that can be applied within working time.

3. Add and mix colorants with materials in accordance with manufacturer's instructions to achieve uniform color.

E. Apply flooring system materials to obtain consistent mil thickness and smooth, uniform appearance and texture.

F. Overlay: Apply overlay in accordance with manufacturer's instructions. Apply overlay to prepared concrete surface.

G. Traction Aggregate: Broadcast traction aggregate in accordance with manufacturer's instructions. Broadcast traction aggregate into wet overlay.

H. Cove:

1. Apply cove primer and cove in accordance with manufacturer's instructions at locations indicated on the Drawings.

2. Apply cove to height and shape as indicated on the Drawings.

3. Apply cove to create seamless, smooth transition between flooring and walls.

I. Seal Coat:

1. Apply seal coat in accordance with manufacturer's instructions.

2. Apply seal coat over traction aggregate.

3.04 FIELD QUALITY CONTROL

A. Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.

B. Manufacturer's Services: Coordinate manufacturer's services in accordance with appropriate sections in Division 01.

3.05 CLEANING AND PROTECTION

A. Allow flooring system to dry in accordance with manufacturer's instructions before opening to traffic.

B. Allow flooring system to dry a minimum of 1 week before cleaning by mechanical means.

C. Protect completed flooring system from damage during construction.

END OF SECTION

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SECTION 101400 - SIGNAGE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Interior - Room and door signs.

B. Interior - Emergency evacuation maps.

C. Exterior Building Identification Signage

D. Scope of work also includes the design, layout, and working with the Contract Officer to provide all sign types, including building evacuation signage. The Government will provide signage contractor with CADD floor plan drawing for use in signage contractor's layout and design.

E. Materials included in this section shall meet the requirements for High Performance Sustainable Buildings for New Construction points for the following Sections:

1. 2-5.3.2 - Reduce Volatile Organic Compounds (VOC) Low-Emitting Materials

2. The contractor is expected to understand the HPSB requirements for these sections and include all applicable overhead in their base bid for the necessary documentation to achieve the above listed credits.

F. UFC 3-120-01 Unified Facilities Criteria Sign Standards.

1.02 SUBMITTALS

A. See Section 01 3001 - Submittals for Submittal procedures.

B. Product Data: Manufacturer's printed product literature for each type of sign, indicating sign styles, font, foreground and background colors, locations, overall dimensions of each sign.

C. Signage Schedule: Provide information sufficient to completely define each sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.

1. When room numbers to appear on signs differ from those on drawings, include the drawing room number on schedule.

2. Submit for approval by Government prior to fabrication.

D. Samples: Submit two samples of each type of sign, of size similar to that required for project, illustrating sign style, font, and method of attachment.

E. Selection Samples: Where colors are not specified, submit two sets of color selection charts or chips.

F. Manufacturer's Installation Instructions: Include installation templates and attachment devices.

G. Sustainability Submittals, Product data for HPSB Compliance:

1. VOC Content Limitations: For the specified products, submit documentation of conformance with Specification Section 01 6116 – Volatile Organic Compound (VOC) Content Restrictions.

2. For products containing VOCs, documentation (material safety data sheets (MSDS), third-party certificates, or test reports) showing printed statement of VOC content.

H. Maintenance Materials: Furnish the following for the Owner's use in maintenance of project.

1.03 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Package signs as required to prevent damage before installation.

B. Package room and door signs in sequential order of installation, labeled by floor or building.

C. Store tape adhesive at normal room temperature.

1.05 SUSTAINABILITY REQUIREMENTS

A. Contractor shall endeavor to provide materials with the lowest possible VOC content.

PART 2 PRODUCTS

2.01 SIGNAGE APPLICATIONS

A. Accessibility Compliance: Signs are required to comply with ADA Standards and ICC A117.1 and applicable building codes, unless otherwise indicated; in the event of

conflicting requirements, comply with the most comprehensive and specific requirements.

B. Room and Door Signs: Provide a sign for every interior doorway, whether it has a door or not, not including corridors, lobbies, and similar open areas.

1. Sign Type: Flat signs with applied character panel media as specified.

2. Provide "tactile" signage, with letters raised minimum 1/32 inch (0.8 mm) and Grade II braille.

3. Sign Height and Width: Refer to Drawings.

   a. Tactile Characters shall be raised the required 1/32 inches from sign face. Glue-on letters or etched backgrounds are not acceptable.

   b. All letters, numbers and/or symbols shall contrast with their background.

   c. Mounting: Vinyl Tape

   d. Border: Borderless

   e. Material: MP Plastic

4. Office Doors: Identify with room numbers to be determined later, not the numbers indicated on drawings; in addition, provide "window" section for replaceable occupant name.

5. Conference and Meeting Rooms: Identify with room numbers to be determined later, not the numbers indicated on drawings; in addition, provide "window" section with sliding "In Use/Vacant" indicator.

6. Service Rooms: Identify with the room names and numbers shown on the drawings as directed by the Contracting Officer.

7. Rest Rooms: Identify with pictograms, the names "MEN" and "WOMEN", room numbers to be determined later, and braille.

C. Egress Signage

1. Provide Tactile exit signage and "no exit" signage where indicated on the drawings. Sign size, typeface, lettering height, and stroke width as required to comply with section 7.10 of NFPA 101. Provide braile lettering at all egress signage.

D. Emergency Evacuation Maps:

1. Layout per vendor as approved by the Government.

E. Refer to Door Schedule for location and type of signs required.

2.02 SIGN TYPES

A. Refer to drawings for configuration.

B. Color and Font: Unless otherwise indicated:

1. Character Font: As selected by the Government from manufacturer's full range of available options.

2. Character Case: As selected by the Government from manufacturer's full range of available options.

3. Background Color: As selected by the Government from manufacturer's full range of available options.

4. Character Color: Contrasting color as selected by the Government from manufacturer's full range of available options.

2.03 TACTILE SIGNAGE MEDIA

A. Applied Character Panels: Acrylic plastic base, with applied acrylic plastic letters and braille.

1. Total Thickness: 1/8 inch (3 mm).

2. Letter Thickness: 1/8 inch (3 mm).

3. Letter Edges: Square.

2.04 ACCESSORIES

A. Concealed Screws: Stainless steel, galvanized steel, chrome plated, or other non-corroding metal. For installation of panel signs on metal stud & gypsum wall board assemblies.

B. Tape Adhesive: Double sided tape, permanent adhesive. For installation of panel signs on existing and new concrete masonry unit wall assemblies.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install neatly, with horizontal edges level.

C. Protect from damage until Beneficial Occupancy; repair or replace damaged items.

END OF SECTION

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SECTION 102113 - STAINLESS STEEL TOILET COMPARTMENTS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Stainless steel toilet compartment partitions overhead braced for following applications:

   a. Toilet enclosures.

   b. Urinal screens.

B. Materials included in this section shall meet the requirements for High Performance Sustainable Buildings for New Construction points for the following Sections:

1. 2-6.1.1 - Recycled Content

2. The contractor is expected to understand the HPSB requirements for these sections and include all applicable overhead in their base bid for the necessary documentation to achieve the above listed credits.

C. Related Requirements:

1. Section 01 3325 - Project Sustainability Summary

2. Section 01 3329 - Sustainable Design Reporting

3. Section 01 6000 - Product Requirements

4. Section 01 6116 – Volatile Organic Compound (VOC) Content Restrictions

5. Division 03 - Concrete

6. Division 05 - Metals

7. Division 06 - Wood, Plastic, and Composites

1.02 REFERENCES

A. ASTM International (ASTM):

1. ASTM A 240 - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.

2. ASTM A 666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.

3. ASTM A 743/A 743M - Standard Specification for Castings, Iron-Chromium, Iron-Chromium-Nickel, Corrosion Resistant, for General Application.

4. ASTM B 86 - Standard Specification for Zinc and Zinc-Aluminum (ZA) Alloy Foundry and Die Castings.

5. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

6. ASTM B 221/B 221M - Standard Specification for Zinc and Zinc-Aluminum (ZA) Alloy Foundry and Die Castings.

B. International Code Council (ICC)/American National Standards Institute (ANSI):

1. ICC/ANSI A117.1 - Accessible and Usable Buildings and Facilities, as applicable to toilet compartments designated as accessible.

C. United States Department of Justice:

1. ADA - Americans with Disabilities Act, Excerpt from 28 CFR Part 36 - ADA Standards for Accessible Design.

1.03 ACTION SUBMITTALS

A. Product Data: Manufacturer's data sheets for each type of product indicated. Include fabrication details, description of materials and finishes.

1. Product Test Reports: When requested by the Government, submit documentation by qualified independent testing agency indicating compliance of products with requirements.

B. Shop Drawings: Include overall product dimensions, floor plan, elevations, sections, details, and attachments to other work. Include choice of options with details.

C. Samples for Selection: Furnish samples of manufacturer's full range of finishes for initial selection.

D. Samples for Verification: Furnish physical sample of material in selected finish.

1. Size: 2 by 2 inch (52 by 52 mm) minimum, in type of finish specified.

E. Informational Submittals

1. Warranty: Sample of special warranty.

F. Closeout Submittals

1. Maintenance and cleaning instructions.

G. Sustainability Submittals, Product data for HPSB Compliance:

1. For products having recycled content, provide documentation indicating percentages by weight of postconsumer and pre-consumer recycled content.

a. Include statement indicating costs (sell price for each product having recycled content)

b. Include the total weight of products provided

2. For products containing VOCs, documentation (material safety data sheets (MSDS), third-party certificates, or test reports) showing printed statement of VOC content.

3. VOC Content Limitations: For the specified products, submit documentation of conformance with Specification Section 01 6116 – Volatile Organic Compound (VOC) Content Restrictions.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Approved manufacturer listed in this section, with minimum [5] years experience in the manufacture of toilet compartments.

B. Manufacturer Qualifications: Approved manufacturer listed in this section, with minimum [5] years experience in the manufacture of toilet compartments. Manufacturers seeking approval must submit the following in accordance with Instructions to Bidders and Division 01 requirements:

C. Installers Qualifications: Experienced Installer regularly engaged in installation of toilet compartments for minimum 5 years.

D. Source Limitations: Obtain toilet compartment components and accessories from single manufacturer.

E. Accessibility Requirements: Comply with requirements of ICC/ANSI 117.1, and with requirements of authorities having jurisdiction.

F. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by qualified testing agency. Identify products with appropriate markings

of applicable testing agency.

1. Flame-Spread Index: 0.

2. Smoke-Developed Index: 0.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver toilet compartments to site until building is enclosed and HVAC systems are in operation.

1. Deliver toilet compartments in manufacturer's original packaging.

2. Store in an upright condition.

1.06 WARRANTY

A. Special Manufacturer’s Warranty: Provide manufacturer's standard form in which manufacturer agrees to repair or replace products that fail in materials or workmanship during the following period after Beneficial Occupancy:

1. Stainless Toilet Partitions: Against rust-out: 15 years.

2. Stainless Steel Hardware: Lifetime.

1.07 SUSTAINABILITY REQUIREMENTS

A. Contractor shall endeavor to provide materials with a high recycled content:

1. See Part 2 of this specification section for specific recycled content thresholds, if applicable.

B. Contractor shall endeavor to provide materials with the lowest possible VOC content.

PART 2 PRODUCTS

2.01 MATERIALS

A. Stainless Steel Sheet: A 666, 300 series commercial stainless steel sheet suitable for exposed applications.

1. Provide with textured finish.

B. Stainless Steel Castings: ASTM A 743/A 743M.

C. Zinc Aluminum Magnesium and Copper Alloy (Zamac): ASTM B 86.

D. Aluminum: ASTM B 221/B 221M.

E. Recycled Content: For Steel Products: Minimum Total Recovered Materials Content - 30%.

2.02 STAINLESS STEEL TOILET COMPARTMENTS

A. Toilet Compartment Type:

1. Overhead braced.

B. Urinal Screen Style:

1. Government-flanged with Wing Bracket:

a. Provide with continuous bracket in addition to wing bracket.

C. Door, Panel, and Pilaster Construction, General: Form edges with interlock to provide watertight fit without crown molding. Braze corners and finish smooth.

1. Provide exposed surfaces free of pitting, visible seams and fabrication marks, stains, telegraphing of core material, or other imperfections.

2. Core Material: Manufacturer's standard sound-deadening, water resistant honeycomb in thickness required to provide finished thickness for doors, panels and pilasters.

D. Door Construction: 1 inch (25 mm) thick, constructed from 0.0313 inch/22 ga (0.794 mm) stainless steel.

1. Provide pre-punched hole to permit field installation of ADA-compliant concealed slide latch.

E. Panel Construction: 1 inch (25 mm) thick, constructed from 0.0313 inch/22 ga (0.794 mm) stainless steel.

1. Grab-Bar Reinforcement: Provide concealed internal reinforcement for grab bars mounted on units.

F. Pilaster Construction: 1 1/4 inch (32 mm) thick, constructed from [0.0375 inch/20 gauge (0.953 mm)] [0.048 inch/18 gauge (1.219 mm)] stainless steel.

1. Provide pilaster with internally welded bracket suitable to accept minimum 3 inch (76 mm) long, 5/16 inch (7.9 mm) stainless steel hex bolt for leveling.

G. Headrail: Extruded anodized aluminum headrail with anti-grip profile. Provide fasteners for attachment to pilaster and stainless steel brackets to secure to wall.

H. Shoes: 4 inches (102 mm) high minimum, Type 304 stainless steel with No. 4 satin brushed finish. Secured to the floor with tamper-resistant screws.

I. Urinal-Screen Construction: Matching toilet compartment panel construction

J. Urinal-Screen Post: Manufacturer's standard post design of [material matching the thickness and construction of; with shoe and sleeve (cap) matching pilaster.

K. Brackets (Fittings):

1. Full-Height (Continuous) Type: Manufacturer's standard design; [stainless steel].

2.03 HARDWARE

A. Hardware, Heavy Duty: Manufacturer's heavy-duty stainless steel castings, including stainless steel tamper-resistant fasteners:

1. Hinges: Self-closing, continuous spring-loaded type, adjustable to hold doors open at any angle up to 90 degrees, with emergency access by lifting door. Mount with stainless steel through-bolts.

2. Latch and Keeper: Surface-mounted slide latch with wrap-around rubber-faced combination door strike and keeper, with provision for emergency access, meeting requirements for accessibility at accessible compartments.

3. Coat Hook: Combination hook and rubber-tipped stop, sized to prevent door from hitting compartment-mounted accessories. Provide wall bumper where door abuts wall. Provide formed L-shaped hook without stop at outswing doors. Mount with stainless steel through-bolts.

4. Door Pull: Standard unit on outside of inswing doors. Provide pulls on both sides of outswing doors.

2.04 FABRICATION

A. Overhead-Braced Units: Provide manufacturer's standard corrosion-resistant supports, leveling mechanism, and anchors at pilasters to suit floor conditions. Provide shoes at pilasters to conceal supports and leveling mechanism.

B. Urinal-Screen Posts: Provide manufacturer's standard corrosion-resistant anchoring assemblies with leveling adjustment at[tops and] bottoms of posts. Provide caps, shoes, and covers at posts to conceal anchorage.

C. Door Size and Swings: Unless otherwise indicated, provide 26-inch- (660-mm-) wide, in-swinging doors for standard toilet compartments and 36-inch- (914-mm-) wide, out-swinging doors with a minimum 32-inch- (813-mm-) wide clear opening for compartments designated as accessible.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine work area to verify that measurements, substrates, supports, and environmental conditions are in accordance with manufacturer's requirements to allow installation.

1. Proceed with installation once conditions meet manufacturer's requirements.

3.02 INSTALLATION

A. General: Comply with manufacturer's written installation instructions. Install units rigid, straight, level, and plumb. Secure units in position with manufacturer's recommended anchoring devices.

B. Install toilet partitions and screens in spaces with operating, temperature controlled HVAC systems. Shield partitions and screens from direct sunlight.

C. Clearances: Install with clearances indicated on Drawings. Where clearances are not indicated, allow maximum 1/2 inch (13 mm) between pilasters and panels, and 1 inch (25 mm) between panels and walls.

3.03 ADJUSTING

A. Hardware Adjustment: Adjust and lubricate hardware according to hardware manufacturer's written instructions for proper operation. Set hinges on in-swinging doors to hold doors open approximately 15 degrees from closed position when unlatched. Set hinges on out-swinging doors and doors in privacy screens to return doors to fully closed position.

3.04 FINAL CLEANING

A. Remove packaging and construction debris and legally dispose of off-site.

B. Clean partition and screen surfaces with materials and cleansers in accordance with manufacturer's recommendations.

END OF SECTION

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SECTION 102223 - MOVABLE WALL SYSTEM

PART 1 - GENERAL

1.01 DESCRIPTION

A. General

1. Furnish and install operable partitions and suspension system. Provide all labor, materials, tools, equipment, and services for operable walls in accordance with provisions of contract documents.

B. Materials included in this section shall meet the requirements for High Performance Sustainable Buildings for New Construction points for the following Sections:

1. 2-5.3.2 - Reduce Volatile Organic Compounds (VOC) Low-Emitting Materials

2. 2-6.1.1 - Recycled Content

3. The contractor is expected to understand the HPSB requirements for these sections and include all applicable overhead in their base bid for the necessary documentation to achieve the above listed credits.

1.02 RELATED SECTIONS:

A. Section 01 3325 - Project Sustainability Summary

B. Section 01 3329 - Sustainable Design Reporting

C. Section 01 6000 - Product Requirements

D. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions

E. Section 09 5100 - Acoustical Ceilings

1.03 SUBMITTALS

A. Complete engineered shop drawings showing unispan truss system, anchorage, connections, bracing, and panel construction are to be provided prior to fabrication indicating construction and installation details. Shop drawings shall be signed and sealed by a engineer registered in the State in which the project is to be constructed.

B. Product Data including manufacturer's standard system components, finish options, construction techniques, and STC testing reports.

C. Installation instructions.

D. Samples of finish material selections for verification.

E. Sustainability Submittals, Product data for HPSB Compliance:

1. For products having recycled content, provide documentation indicating percentages by weight of postconsumer and pre-consumer recycled content.

   a. Include statement indicating costs (sell price for each product having recycled content)

   b. Include the total weight of products provided

2. For products containing VOCs, documentation (material safety data sheets (MSDS), third-party certificates, or test reports) showing printed statement of VOC content

3. VOC Content Limitations: For the specified products, submit documentation of conformance with Specification Section 01 6116 – Volatile Organic Compound (VOC) Content Restrictions.

1.04 QUALITY ASSURANCE

A. Preparation of the opening shall conform to the criteria set forth per ASTM E557 Standard Practice for Architectural Application and Installation of Operable Partitions

B. The partition STC (Sound Transmission Classification) shall be achieved per the standard test methods ASTM E90.

C. Noise isolation classifications shall be achieved per the standard test methods ASTM E336 and ASTM E413.

D. Noise Reduction Coefficient (NRC) ratings shall be per ASTM C423.

E. Rack testing for 10 years. (tensional strength stress test)

F. The manufacturer shall have a quality system that is registered to the ISO 9001 standards.

1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Proper storage of partitions before installation and continued protection during and after installation will be the responsibility of the General Contractor.

1.06 WARRANTY

A. Partition system shall be guaranteed for a period of two years against defects in material and workmanship, excluding abuse.

1.07 SUSTAINABILITY REQUIREMENTS

A. Contractor shall endeavor to provide materials with a high recycled content:

1. See Part 2 of this specification section for specific recycled content thresholds, if applicable.

B. Contractor shall endeavor to provide materials with the lowest possible VOC content.

PART 2 - PRODUCTS

2.01 BASIS OF DESIGN

A. The basis of design is a paired panels system with a self supporting engineered truss system.

2.02 MATERIALS

A. Product to be top supported paired panels configured as indicated on the drawings.

1. Panels shall be nominally 3” thick, up to 48” in width, and hinged in pairs.

2. Panel faces shall be laminated to appropriate substrate to meet the STC requirement in 2.04 Acoustical Performance.

3. Frames shall be of 16 gauge [1.42mm] painted steel with integral factory applied aluminum vertical edge and face protection.

4. Vertical sound seals shall be of tongue and groove configuration, ensure panel-to-panel alignment and prevent sound leaks between panels.

5. Horizontal top seals shall be fixed continuous contact dual 4-finger vinyl.

6. Horizontal bottom seals shall be retractable, provide up to 2” [50] nominal operating clearance, and exert downward force when extended.

7. Horizontal trim shall be of aluminum.

8. Low profile hinges on basic panels shall be of steel and project no more than 1/4” beyond panel faces. Each pair of panels to have a minimum of three hinges.

B. Weight of the panels shall be 5.7-10.2 lbs. per sq. ft. [27.8-49.8kg/sq.m] based on options selected.

1. Suspension system:

a. The panels shall be supported by a pre-engineered truss and post system fabricated of steel and aluminum. The truss system shall be attached to the building structure for lateral support only. The load of the truss and partition is supported by end columns. The columns are connected to floor plates that distribute the load of the system at the floor.

b. Components:

1) Bolt together truss has anodized aluminum top and bottom cords with integral anodized aluminum track and steel web-members.

2) End columns shall be 2-1/2" x 5" [63.5 x 127] clear anodized aluminum posts.

3) Posts shall be attached to the truss with steel brackets and bolts.

4) Posts shall be anchored to the floor with concealed fasteners.

5) Posts shall be located approximately 1-1/2" [38mm] from adjacent wall surfaces.

6) The space between the post and the adjacent wall shall be fitted with a vinyl gasket to inhibit sound.

7) Ceiling anchors provide lateral support and shall be set at intervals across the span of the beam. Blocking for ceiling anchors to be provided by others in accordance with the plans.

8) Weight of the system

(a) The horizontal truss shall weigh 10-12 lbs. per lineal foot of width.

(b) The support columns shall weigh 3.5 lbs. per foot of height each.

(c) The floor shall support a maximum of 360 psi at each post.

9) Finishes:

(a) Exposed trim and track shall be of clear anodized architectural grade extruded aluminum alloy 6063-T6.

(b) Posts shall be of clear anodized architectural grade extruded aluminum alloy 6063-T6.

10) Header Side Panels:

(a) Manufacturer's standard Medium Density Fiberboard Header Side Panels shall be provide to cover both sides of truss.

(b) Provide fabric covering on header side panels as selected by the Contracting Officer from manufacturer's full range of standard colors.

c. Finishes

1) Face finish shall be:

(a) Factory applied reinforced vinyl fabric with woven backing, weighing not less than 15 oz. per lineal yard [465 g/m]. Color shall be selected from manufacturer's standard color selectors.

d. Aluminum track shall be clear anodized

C. Recycled Content: For partition assembly: Minimum Total Recovered Materials Content - 50%

2.03 OPERATION

A. Panels shall be manually moved from the storage area, positioned in the opening, and seals set.

1. Retractable Horizontal Seals

a. Retractable horizontal seals shall be activated by a removable quick-set operating handle located approximately 42" [1067 mm] from the floor in the panel edge.

b. All retractable seals in each hinged pair shall be operated simultaneously.

c. Seal activation requires approximately 15 lbs. [6.8 kg] of force per panel and approximately a 190 degree turn of the removable handle.

2. Automatic Floor Seals

a. Horizontal seals shall be activated by pressing the edge of the panel into the edge of the adjacent panel or wall.

b. Seal activation requires approximately 15 lbs. [6.8 kg] of force per panel.

3. Final partition closure to be:

a. Lever closure panel with expanding jamb which compensates for minor wall irregularities and provides a minimum of 250 lbs. [113.4kg] seal force against the adjacent wall for optimum sound control. The jamb activator shall be located approximately 45" [1143] from the floor in the panel face and be accessed from either side of the panel. The jamb is equipped with a mechanical rack and pinion gear drive mechanism and shall extend 4"-6" [100-152] by turning the removable operating handle.

4. Stack/Store Panels

a. Retract seals and move to storage area. Panels may be stored at either or both ends of the track or in a pocket.

2.04 ACOUSTICAL PERFORMANCE

A. Acoustical performance shall be tested at a laboratory accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) and in accordance with ASTM E90 Test Standards. Standard panel construction shall have obtained an STC rating of: 45.

PART 3 – EXECUTION

3.01 INSTALLATION

A. The complete installation of the operable wall and engineered truss system shall be by an authorized factory-trained installer and be in strict accordance with the approved shop drawings and manufacturer's standard printed specifications, instructions, and recommendations.

3.02 CLEANING

A. All track and panel surfaces shall be wiped clean and free of handprints, grease, and soil.

B. Cartoning and other installation debris shall be removed to onsite waste collection area, provided by others.

3.03 TRAINING

A. Installer shall demonstrate proper operation and maintenance procedures to Government representative.

B. Operating handle and owners manuals shall be provided to Contracting Officer Representative.

END OF SECTION

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SECTION 102800 - TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Commercial toilet accessories.

B. Accessories for toilet rooms and utility rooms.

C. Grab bars.

1.02 RELATED REQUIREMENTS

A. Section 093000 - Tiling: Ceramic washroom accessories.

B. Section 10 2113 - Stainless Steel Toilet Compartments

1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design 2010.

B. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service 2022.

C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2022.

D. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar 2015.

E. ASTM B456 - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium 2017 (Reapproved 2022).

F. GSA CID A-A-3002 - Mirrors, Glass; U.S. General Services Administration; 1996.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the work with the placement of internal wall reinforcement, concealed ceiling supports, and reinforcement of toilet partitions to receive anchor attachments.

1.05 SUBMITTALS

A. See Section 01 3001 - Submittals for Submittal procedures.

B. Product Data: Submit data on accessories describing size, finish, details of function, and attachment methods.

C. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

PART 2 PRODUCTS

2.01 MATERIALS

A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.

1. Grind welded joints smooth.

2. Fabricate units made of metal sheet of seamless sheets, with flat surfaces.

B. Keys: Provide keys for each accessory to the Contracting Officer Representative; master key lockable accessories.

C. Stainless Steel Sheet: ASTM A666, Type 304.

D. Stainless Steel Tubing: ASTM A269/A269M, Grade TP304 or TP316.

E. Galvanized Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating.

F. Adhesive: Two component epoxy type, waterproof.

G. Fasteners, Screws, and Bolts: Hot dip galvanized; tamper-proof; security type.

H. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

2.02 FINISHES

A. Stainless Steel: Satin finish, unless otherwise noted.

B. Chrome/Nickel Plating: ASTM B456, SC 2, polished finish, unless otherwise noted.

C. Baked Enamel: Pretreat to clean condition, apply one coat primer and minimum two coats epoxy baked enamel.

2.03 TOILET ACCESSORIES:

A. Surface Mounted Towel Dispenser/ Waste Receptacle:

1. Cabinet — 18-8, type-304, heavy-gauge stainless steel. All-welded construction. Exposed satin finish. Equipped with a tumbler lock.

2. Flange: 18-8, Type 304, 22-guage stainless steel, satin finish. Drawn and beveled, one-piece, seamless construction.

3. Skit: 18-8, Type 304, 22-guage stainless steel with satin finish.

4. Door: 18-8, Type 304, 20-gauge (0.9mm) stainless steel with satin-finish. Drawn, one-piece, seamless construction. Secured to cabinet with a full-length stainless steel piano-hinge. Equipped with a concealed tumbler lock.

5. Touch-Free Roll Towel Mechanism — Durable, high-impact resin materials. Accepts standard-core rolls up to 8" (205mm) wide, 8" (205mm) diameter. 800 ft (244mm) long. Dispenses one 12" (300mm) length of towel paper per pull.

6. Waste Receptacle — 18-8 Type 304, 22-gauge (0.8mm) stainless steel with satin finish. Front and sides of bottom and all top edges are hemmed for safe handling. Secured to cabinet with a tumbler lock keyed like other Bobrick washroom accessories. Capacity: 12-gal. (45.5-L).

B. Toilet Paper Holder:

1. Commercial Grade, High Capacity with lock.

2. Holds two rolls up to 9 inch diameter.

3. Size: 12.5 inches x 19.88 inches x 6 inches.

C. Electric Hand Dryer:

1. Electrical Characteristics:

a. Voltage: 120V

b. Standby Power Consumption: 0.5W

c. 1,000W digital brushless motor

d. Motor Switching Rate: 5,500 per second

e. Motor Speed 83,000 rpm

2. ADA Compliant Low Profile Configuration projecting less than 4" from face of wall.

3. Polycarbonate Fascia Construction:

4. Antibacterial Sprayed Nickel Coating Finish

5. Sealed HEPA filter constructed of glass fiber and fleece prelayer. Filter capable of removing 99.7% of bacteria, as small as 0.3 microns, including both bacteria and viruses.

6. Operation:

   a. Touch free capacitive sensor activation

   b. 12 second Hand dry time measurement based on NSF Proteocol P.335)

   c. Sound Power Leve: 79dB(A)

   d. Airspeed at Aperture: 420 mph

7. Manufacturer's 5 year parts and labor warranty.

D. L Shaped Grab Bar.

1. Grab Bar — 18-8, type-304, 18-gauge (1.2mm) stainless steel tubing with satin-finish. 1-1/4" (32mm) outside diameter. Ends are heliarc welded to concealed mounting flanges. Clearance between the grab bar and wall is 1-1/2" (38mm).

2. Concealed Mounting Flanges — 18-8, type-304, 11-gauge (3.2mm) thick, stainless steel plate; end flanges 2" x 3-1/8" (50 x 80mm) with holes for attachment to wall. Intermediate flanges 2-5/8" x 3-1/8" (65 x 80mm) wide x 3-1/8" (80mm) diameter.

3. Snap Flange Covers — 18-8, type-304, 22-gauge (0.8mm) drawn stainless steel with satin-finish. 3-1/4" (85mm) diameter x 5/8" (16mm) deep. Each cover snaps over mounting flange to conceal mounting screws.

4. Strength - Bobrick grab bars that provide 1-1/2" (38mm) clearance from wall can support loads in excess of 900 pounds (408kg) if properly installed. Other grab bar configurations can support loads in excess of 250 pounds (113kg) if properly installed, complying with accessible design (including ADAAG in the U.S.A.) for structural strength.

E. Wall Mounted Soap Dispenser

1. Container — Body is 18-8, Type-304, 20-gauge (1.0mm) stainless steel with satin-finish. Drawn, one-piece, seamless construction. Front has same degree of arc as other washroom accessories. Radius on corners and edges complement other accessories. Back plate is 22-gauge (0.8mm) stainless steel with 20-gauge (1.0mm) stainless steel mounting bracket attached. Container body and back plate are epoxy-sealed to prevent warping and leakage. Concealed wall plate is 20-gauge

(1.0mm) stainless steel. Equipped with a plastic soap refill-indicator window and a locked, hinged stainless steel lid for top filling. Capacity: 40-fl oz (1.2-L)

2. Valve — Black molded plastic push button. Soap head-holding mushroom valve. Stainless steel spring. U-packing seal and duckbill. Antibacterial-soap-resistant plastic cylinder.

F. 42" Grab Bar:

1. Grab Bar — 18-8 S, type-304, 18-gauge (1.2mm) stainless steel tubing with satin-finish. 1-1/2" (38mm) outside diameter. Ends are heliarc welded to flanges.

2. Clearance between the grab bar and wall is 1-1/2" (38mm).

3. Concealed Mounting Flanges — 18-8 S, type-304, 11-gauge (3.2mm) thick, stainless steel plate; end flanges 2" x 3-1/8" (50 x 80mm) with holes for attachment to wall. Intermediate flanges 2-5/8" x 3-1/8" (65 x 80mm) wide x 3-1/8" (80mm) diameter.

4. Snap Flange Covers — 18-8 S, type-304, 22-gauge (0.8mm) drawn stainless steel with satin-finish. 3-1/4" (85mm) diameter x 1/2" (13mm) deep. Each cover snaps over mounting flange to conceal mounting screws.

5. Strength - capable of supporting loads in excess of 900 lbs (408 kg).

G. 36” Grab Bar:

1. Grab Bar — 18-8 S, type-304, 18-gauge (1.2mm) stainless steel tubing with satin-finish. 1-1/2" (38mm) outside diameter. Ends are heliarc welded to flanges.

2. Clearance between the grab bar and wall is 1-1/2" (38mm).

3. Concealed Mounting Flanges — 18-8 S, type-304, 11-gauge (3.2mm) thick, stainless steel plate; end flanges 2" x 3-1/8" (50 x 80mm) with holes for attachment to wall. Intermediate flanges 2-5/8" x 3-1/8" (65 x 80mm) wide x 3-1/8" (80mm) diameter.

4. Snap Flange Covers — 18-8 S, type-304, 22-gauge (0.8mm) drawn stainless steel with satin-finish. 3-1/4" (85mm) diameter x 1/2" (13mm) deep. Each cover snaps over mounting flange to conceal mounting screws.

5. Strength - capable of supporting loads in excess of 900 lbs (408 kg).

H. Omitted

I. 18” Grab Bar:

1. Grab Bar — 18-8 S, type-304, 18-gauge (1.2mm) stainless steel tubing with satin-finish. 1-1/2" (38mm) outside diameter. Ends are heliarc welded to flanges.

2. Clearance between the grab bar and wall is 1-1/2" (38mm).

3. Concealed Mounting Flanges — 18-8 S, type-304, 11-gauge (3.2mm) thick, stainless steel plate; end flanges 2" x 3-1/8" (50 x 80mm) with holes for attachment to wall. Intermediate flanges 2-5/8" x 3-1/8" (65 x 80mm) wide x 3-1/8" (80mm) diameter.

4. Snap Flange Covers — 18-8 S, type-304, 22-gauge (0.8mm) drawn stainless steel with satin-finish. 3-1/4" (85mm) diameter x 1/2" (13mm) deep. Each cover snaps over mounting flange to conceal mounting screws.

5. Strength - capable of supporting loads in excess of 900 lbs (408 kg).

J. Omitted

K. Mirror:

1. Size: 18" x 36"

2. Frame — 18-8, heavy-gauge stainless steel, 3/4" x 3/4" (19 x 19mm) angle with satin finish. One-piece, roll-formed construction forms continuous integral stiffener on all sides. Bevel design on front of angle holds frame tightly against mirror. Corners of mirror frame are heliarc welded, ground and polish smooth. Galvanized steel back is fastened to frame with concealed screws and equipped with integral horizontal hanging brackets near the top and bottom of the mirror for hanging the mirror and to prevent the mirror from pulling away from the wall. Locking devices secure mirror to concealed wall hanger.

3. Mirror — No. 1 quality, 1/4" (6mm) select float glass (standard glass): selected for silvering, electrolytically copper-plated by the galvanic process, and guaranteed for 15 years against silver spoilage. All edges protected by plastic filler strips; back is protected by full-size, shock-absorbing, water-resistant, nonabrasive, 3/16" (5mm) thick polyethylene padding.

4. Concealed Wall Hanger — Galvanized steel construction. Incorporates upper and lower support members, which engage lower backplate louvers to keep bottom of mirror against wall

L. Mirror 24' x 72"

1. Size: 24" x 72"

2. Frame — 18-8, heavy-gauge stainless steel, 3/4" x 3/4" (19 x 19mm) angle with satin finish. One-piece, roll-formed construction forms continuous integral stiffener on all sides. Bevel design on front of angle holds frame tightly against mirror. Corners of mirror frame are heliarc welded, ground and polish smooth. Galvanized steel back is fastened to frame with concealed screws and equipped with integral horizontal hanging brackets near the top and bottom of the mirror for hanging the mirror and to prevent the mirror from pulling away from the wall. Locking devices secure mirror to concealed wall hanger.

3. Mirror — No. 1 quality, 1/4" (6mm) select float glass (standard glass): selected for silvering, electrolytically copper-plated by the galvanic process, and guaranteed for 15 years against silver spoilage. All edges protected by plastic filler strips; back is protected by full-size, shock-absorbing, water-resistant, nonabrasive, 3/16" (5mm) thick polyethylene padding.

4. Concealed Wall Hanger — Galvanized steel construction. Incorporates upper and lower support members, which engage lower backplate louvers to keep bottom of mirror against wall

M. Folding shower seat:

1. Provide seat width as required by all applicable codes.

2. Seat — One-piece, 5/16" (8mm) thick, solidly fused plastic laminate with matte-finish melamine surfaces, ivory-colored face sheets, and black phenolic-resin core that are integrally bonded — cannot delaminate. Integral slots for water drainage. Secured to frame with stainless steel carriage bolts and acorn nuts.

3. Frame — 18-8, type-304, stainless steel with satin finish. 16-gauge (1.6mm), 1-1/4" (30mm) square tubing and 18 -gauge (1.2mm), 1" (25mm) diameter seamless tubing

4. Mounting Flanges (2) — 18-8, type-304, 3/16" (5mm) thick stainless steel with satin finish. 3" (75mm) diameter with three mounting screw holes.

5. Baseplate — 18-8, type-304, heavy-gauge stainless steel.

6. Spring — 17-7, type-301, 24-gauge (0.6mm) stainless steel. Spot-welded to baseplate.

7. Guide Bracket — 18-8, type-304, 16-gauge (1.6mm) stainless steel with satin finish.

8. Operation - Shower seat can be folded up against the wall when not in use. The spring at the top of baseplate locks seat into upright position until released by pulling the top of seat away from wall. Support system with guide bracket allows varying mounting heights and leaves floor clear for easier cleaning. Nonporous solid phenolic seat has slots to permit water to drain, does not splinter or require oiling, and will not support growth of bacteria. Slotless round-head carriage bolts and acorn nuts provide additional safety to user. Bobrick shower seats, when properly installed, have sufficient strength to support 500 lbs., (227 kg) complying with accessible design guidelines (including ADAAG in the U.S.A.).

N. Omitted

O. Shower Curtain & Accessories:

1. Curtain Rod:

   a. Curtain Rod — 18-8, Type-304, 20-gauge (1.0mm) stainless steel tubing with satin finish. 1" (25mm) outside diameter. Available in lengths 36" (915mm) up to 72" (1830mm).

   b. Flanges — 18-8, Type-304, 20-gauge (1.0mm) stainless steel with satin finish. Drawn, one-piece, seamless construction.

2. Shower Curtain:

   a. Opaque, matte white vinyl 0.008" (0.2mm) thick, containing antibacterial and flame-retardant agents. Nickel-plated brass grommets along top, one every 6" (150mm). Bottom and sides are hemmed.

3. Curtain Hooks:

   a. 18-8, Type-304, 0.09" (2mm) diameter stainless steel.

   b. Provide hook quantity as required to install shower curtain.

P. Utility shelf / mop holder. One per each Janitors Closet.

1. Mounting Base and Shelf — 18-8, type-304, 18-gauge (1.2mm) stainless steel with satin finish. All-welded construction. Shelf is 8" (205mm) deep with 3/4" (19mm) return edge on all three sides. Front edge is hemmed for safety.

2. Shelf Support Brackets — 18-8, type-304, 16-gauge (1.6mm) stainless steel with satin finish. Welded to mounting base and shelf.

3. Mop/Broom Holders — Spring-loaded rubber cams with anti-slip coating. Plated steel retainers.

4. Hooks — 18-8, type-304, 12-gauge (2.8mm) stainless steel with satin finish. Each hook attached to mounting strip with two rivets.

5. Utility shelf / mop holder. Equal to B-239- 34 -one per each Janitors Closet.

Q. Hat & Coat Hook:

1. Flange and Support Arm — 18-8, type-304, 22-gauge (0.8mm) stainless steel. Concealed, 16-gauge (1.6mm) stainless steel mounting bracket. All-welded construction. Secured to wall plate with a stainless steel setscrew.

2. Concealed Wall Plate — 18-8, type-304, 16-gauge (1.6mm) stainless steel.

3. Cap — 18-8, type-304, 10-gauge (3.6mm) stainless steel. Welded to the support arm.

Provide concealed wood blocking for all toilet accessories to be installed in metal stud wall assemblies. Where toilet accessories are the located in CMU walls, comply with manufacturer's recommendations. Coordinate and provide filled CMU cells where applicable. Mount and locate per ADA. Coordinate with all other trades.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify exact location of accessories for installation.

3.02 INSTALLATION

A. Install accessories in accordance with manufacturers' instructions in locations indicated on drawings.

B. Install plumb and level, securely and rigidly anchored to substrate.

C. Mounting Heights: As required by accessibility regulations, unless otherwise indicated.

END OF SECTION

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SECTION 104400 - FIRE PROTECTION SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fire extinguishers.

B. Fire extinguisher cabinets.

C. Accessories.

D. Materials included in this section shall achieve HPSB Compliance for the following section (s):

1. 2-6.1.3 Ozone Depleting Substances

2. The Contractor is expected to understand the HPSB documentation requirements for these credits and include all applicable overhead in their base bid for the necessary documentation to achieve the above listed credit.

1.02 RELATED REQUIREMENTS

A. Section 01 3325 - Project Sustainability Summary

B. Section 01 3329 - Sustainable Design Reporting

C. Section 01 6000 - Product Requirements

D. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions

E. Section 061000 - Rough Carpentry: Wood blocking product and execution requirements.

1.03 REFERENCE STANDARDS

A. FM (AG) - FM Approval Guide Current Edition.

B. NFPA 10 - Standard for Portable Fire Extinguishers 2022.

C. UL (DIR) - Online Certifications Directory Current Edition.

1.04 SUBMITTALS

A. See Section 01 3001 - Submittals for Submittal procedures.

B. Manufacturer's Installation Instructions: Indicate special criteria and wall opening coordination requirements.

C. Maintenance Data: Include test, refill or recharge schedules and re-certification requirements.

D. Sustainability Submittals, Product data for HPSB Compliance:

1. Documentation (material safety data sheets (MSDS), third-party certificates, or test reports) showing printed statement confirming that ozone depleting substances are not utilized in the product.

PART 2 PRODUCTS

2.01 FIRE EXTINGUISHERS

A. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.

1. Provide extinguishers labeled by UL (DIR) or FM (AG) for purpose specified and as indicated.

B. Type Fire Extinguishers that contain no ozone-depleting substances such as CFCs, Hydrochlorofluorocarbons (HCFCs) or Halons per HPSB requirements: Carbon steel tank, with pressure gage.

1. Class: A:B:C type.

2. Size: 10 pound (4.54 kg).

3. Finish: Baked polyester powder coat Red color.

2.02 FIRE EXTINGUISHER CABINETS

A. Cabinet Configuration: Semi-recessed type with full clear door.

1. Size to accommodate accessories.

B. Door Glazing: Tempered glass, clear, 1/8 inch (3 mm) thick, and set in resilient channel glazing gasket.

C. Finish of Cabinet Exterior Trim and Door: No. 4 - Brushed stainless steel.

D. Finish of Cabinet Interior: White colored enamel.

2.03 FIRE EXTINGUISHER BRACKET

A. Provide Standard Fire Extinguisher Bracket.

PART 3 EXECUTION

3.01 EXAMINATION

A. If installed in metal stud wall provide solid wood blocking at top, bottom, and sides of cabinet locations prior to installation of cabinet

B. Verify rough openings for cabinet are correctly sized and located.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Place extinguishers in cabinets.

C. Position cabinet signage at the Government.

END OF SECTION

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SECTION 105100 - LOCKERS

LOCKERS

1.01 SECTION INCLUDES

A. Solid plastic lockers.

B. Locker units with hinged doors.

C. Materials included in this section shall meet the requirements for High Performance Sustainable Buildings for New Construction points for the following Sections:

1. 2-6.1.1 - Recycled Content

2. 2-5.3.2 - Reduce Volatile Organic Compounds (VOC) Low-Emitting Materials

1.02 REFERENCE STANDARDS

A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2015a.

B. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth 2015.

1.03 SUBMITTALS

A. See Section 01 3001 - Submittals, for submittal procedures.

B. Product Data: Manufacturer's published data on locker construction, sizes and accessories.

C. Shop Drawings: Indicate locker plan layout, numbering plan and per approval of contract officer.

D. Samples: Submit two samples in size, of each color scheduled.

E. Manufacturer's Installation Instructions: Indicate component installation assembly.

F. Sustainability Submittals, Product data for HPSB Documentation:

1. For products having recycled content, documentation indicating percentages by weight of postconsumer and pre-consumer recycled content.

a. Include statement indicating costs (sell price for each product having recycled content)

b. Total weight of products provided

2. For products having Biologically Based Products, documentation indicating percentages of Biologically Based Products

3. VOC Content Limitations:

a. For products containing VOCs, documentation (material safety data sheets (MSDS), third-party certificates, or test reports) showing printed statement of VOC content.

b. For the specified products, submit documentation of conformance with Specification Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

1.04 MOCK-UP

A. Mock-up may remain as part of the Work.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Protect locker finish and adjacent surfaces from damage.

1.06 SUSTAINABILITY REQUIREMENTS

A. Contractor shall endeavor to provide materials with a high recycled content:

1. See Part 2 of this specification section for specific recycled content thresholds, if applicable.

B. Contractor shall endeavor to provide materials with the lowest possible VOC content.

PART 2 PRODUCTS

2.01 LOCKER APPLICATIONS

2.02 SOLID PLASTIC LOCKERS

A. Lockers:

1. Doors: Full overlay without frame.

2. Ventilation: By horizontal slots at the top and bottom of door.

3. Door Color: To be selected by the Contracting Officer from manufacturer's full range of available colors.

4. Body Color: To be selected by the Contracting Officer from manufacturer's full range of available colors.

B. Component Thicknesses:

1. Doors: 1/2 inch (13 mm) minimum thickness.

2. Locker Body: Tops, bottoms, backs, and shelves 3/8-inch (10 mm) minimum.

3. End Panels and Filler Panels: 1/2 inch (13 mm) minimum thickness.

4. Sloped Tops: 1/2 inch (13 mm) minimum thickness.

C. Solid Plastic Panels: High Density polyethylene (HDPE) formed under high pressure into solid plastic components.

D. Hinges: Full height of locker, manufacturer's standard heavy-duty type.

E. Coat Hooks: Stainless steel; attached with tamperproof screws.

F. Number Plates: Provide rectangular shaped aluminum plates. Form numbers 1 inch (25 mm) high of block font style with ADA designation, in contrasting color.

G. Locks: Locker manufacturer's standard type of style indicated above.

2.03 MATERIALS

A. Factory assembled, made of high-density polyethylene (HDPE) panels, tested in accordance with NFPA 286, homogenous color throughout, with mortise and tenon joints with stainless steel fasteners or heat fused joints.

1. HDPE - Recycled Content: 100% Post-consumer content, minimum.

2.04 LOCKER UNITS

A. Width: 12 inches (300 mm).

B. Depth: 15 inches (380 mm).

C. Height: 72 inches (1,830 m).

D. Configuration: Double tier.

E. Mounting: Surface mounted.

F. Fittings: Hat shelf, 2 coat hooks.

G. Base: See Detail on drawings.

1. Height of tile base (typical)

H. Top: Sloped plastic with closures.

I. Locking: Equipped for padlock hasps.

J. Ventilation Method: Door louvers.

K. Fabricate sloped metal tops, ends and closure pieces.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that prepared bases are in correct position and configuration.

B. Verify bases and embedded anchors are properly sized.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install lockers plumb and square.

C. Place and secure on prepared base.

D. Secure lockers with anchor devices to suit substrate materials. Minimum Pullout Force: 100 lb (445 N).

E. Bolt adjoining locker units together to provide rigid installation.

F. Install end panels, filler panels, and sloped tops.

G. Install accessories.

H. Replace components that do not operate smoothly.

3.03 CLEANING

A. Clean locker interiors and exterior surfaces.

END OF SECTION

SECTION 108500 - SPECIALTIES

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Recycling Containers.

1.02 SUBMITTALS

A. Recycling Containers:

1. Product Data: Submit product data showing compliance with specified requirements.

PART 2 - PRODUCTS

2.01 RECYCLING CONTAINERS

A. Provide 10 - 23 gallon containers compatible with specified lids and trolley assemblies.

B. Provide in color multiple colors as selected by Contracting Officer from manufacturer's full range.

C. Provide standard recycling symbols on each can. Provide painted lettering for type of recycled materials to be deposited in each can as directed by the Contracting officer.

D. Accessories:

1. Provide lids compatible with containers to be provided. Lids as selected by Contracting Officer to have profiles suitable for recycled materials intended to be deposited in each can.

2. Provide trolley assembly compatible with cans to be provided and able to be linked together to move multiple cans at one time. Provide one trolley per container.

PART 3 – EXECUTION

3.01 PREPARATION

A. Visit job site, field verify all dimensions and coordinate requirements for hoist & trolley mounting with General Contractor prior to fabricate.

3.02 INSTALLATION

A. Install shall be in accordance with approved shop drawings and manufacturer's recommendations and instructions.

3.03 PROTECTION

A. Coordinate installation of work specified herein to be accomplished after majority of building construction and site work is accomplish.

B. Protect work specified herein from damage by adjacent construction activities as required.

END OF SECTION

SECTION 113013 - RESIDENTIAL APPLIANCES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Kitchen appliances.

B. Materials included in this section shall meet the requirements for High Performance Sustainable Buildings for New Construction points for the following Sections:

1. 2-3.1.4 - Energy Efficient Products

C. The contractor is expected to understand the HPSB requirements for these sections and include all applicable overhead in their base bid for the necessary documentation to achieve the above listed credits.

1.02 RELATED REQUIREMENTS

A. Section 01 3325 - Project Sustainability Summary

B. Section 01 3329 - Sustainable Design Reporting

C. Section 064100 - Architectural Wood Casework

D. Section 123600 - COUNTERTOPS, AND WINDOW SILLS

E. Division 21 - Plumbing

F. Division 26 - Electrical

1.03 REFERENCE STANDARDS

A. UL (DIR) - Online Certifications Directory Current Edition.

1.04 SUBMITTALS

A. See Section 01 3001 - Submittals , for submittal procedures.

B. Product Data: Manufacturer's data indicating dimensions, capacity, and operating features of each piece of residential equipment specified.

C. Copies of Warranties: Submit manufacturer warranty and ensure that forms have been completed in Government's name and registered with manufacturer.

D. Sustainability Submittals, Product Data for HPSB Compliance:

1. Manufacturer's data showing certification or registration through Energy Star or Federal Energy Management Program

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

B. Electric Appliances: Listed and labeled by UL (DIR) and complying with NEMA Standards (National Electrical Manufacturers Association).

1.06 WARRANTY

A. See Section 017800 - Closeout Submittals, for additional warranty requirements.

B. Provide five (5) year manufacturer warranty on refrigeration system of refrigerators.

C. Provide ten (10) year manufacturer warranty on magnetron tube of microwave ovens.

PART 2 PRODUCTS

2.01 KITCHEN APPLIANCES

A. Provide Equipment Eligible for Energy Star Rating: Energy Star Rated.

B. Refrigerator: Free-standing, side-by-side, and frost-free.

1. Capacity: Total minimum storage of 24 cubic ft (0.67 cu m); minimum 15 percent freezer capacity.

2. Energy Usage: Minimum 20 percent more energy efficient than energy efficiency standards set by U.S. Department of Energy (DOE).

3. Features: Include glass shelves, automatic icemaker, and light in freezer compartment.

4. Exterior Finish: Stainless steel.

C. Microwave: Countertop.

1. Capacity: 1.5 cubic ft (0.042 cu m).

2. Power: 1000 watts.

3. Features: Include turntable.

4. Exterior Finish: Black.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify utility rough-ins are provided and correctly located.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

3.03 ADJUSTING

A. Adjust equipment to provide efficient operation.

3.04 CLEANING

A. Remove packing materials from equipment and properly discard.

B. Wash and clean equipment.

END OF SECTION

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SECTION 115213 - CEILING-RECESSED FRONT PROJECTION SCREENS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Electrically operated, ceiling recessed, front projection screens.

B. Materials included in this section shall meet the requirements for High Performance Sustainable Buildings for New Construction points for the following Sections:

1. 2-3.1.5 - Standby Powered Devices

2. The contractor is expected to understand the HPSB requirements for these sections and include all applicable overhead in their base bid for the necessary documentation to achieve the above listed credits.

1.02 RELATED SECTIONS

A. Section 01 3325 - Project Sustainability Summary

B. Section 01 3329 - Sustainable Design Reporting

C. Section 01 6000 - Product Requirements

D. Division 5 - Metal Fabrications: Suspension systems for projection screens.

E. Section 09 51 00 - Suspended Acoustical Ceilings.

F. Division 26 for electrical wiring, connections, and installation of remote control switches for electrically operated projection screens.

1.03 REFERENCES

A. NFPA 70 - National Electrical Code.

B. NFPA 701-99 - Fire Tests for Flame-Resistant Textiles and Films.

1.04 SUBMITTALS

A. Submit under provisions of Section 01.

B. Product Data: Manufacturer's data sheets on each product to be used, including:

1. Preparation instructions and recommendations.

2. Storage and handling requirements and recommendations.

3. Installation methods.

C. Wiring diagram for electrically operated units.

D. Shop Drawings: Shop drawings showing layout and types of projection screens. Show the following:

1. Location of screen centerline.

2. Location of wiring connections.

3. Seams in viewing surfaces.

4. Detailed drawings for concealed mounting.

5. Connections to suspension systems.

6. Anchorage details.

7. Accessories.

8. Frame details.

E. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

F. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

G. Sustainability Submittals, Product data for HPSB Compliance:

1. For products using electricity, documentation showing printed statement that device meets FEMP designated efficiency requirements or Energy Star qualified.

2. If the product has a "standby" mode, submit documentation showing that less that one (1) watt of power is consumed when in "standby" mode

1.05 QUALITY ASSURANCE

A. Single Source Responsibility: Obtain each type of projection screen required from a single manufacturer as a complete unit, including necessary mounting hardware and accessories.

B. Coordination of Work: Coordinate layout and installation of projection screens with other construction supported by, or penetrating through, ceilings, including light fixtures, HVAC equipment, fire-suppression system, and partitions.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver projection screens until building is enclosed and other construction where screens will be installed is substantially complete.

B. Store products in manufacturer's unopened packaging until ready for installation.

C. Protect screens from damage during delivery, handling, storage, and installation.

1.07 COORDINATION

A. Coordinate work with installation of ceilings, walls, electric service power characteristics, and location.

PART 2 PRODUCTS

2.01 MOTORIZED, CEILING RECESSED, FRONT PROJECTION SCREENS

A. Refer to reflected ceiling plans for locations.

B. Electric motor operated, steel case. Ceiling-recessed, 18-gauge steel headbox, 6-1/2 inches (182 mm) deep and 6-13/16 inches (182 mm) wide with white paint finish and stamped 13-gauge steel end caps. UL approved "Suitable for use in environmental air space." Bottom closure panel forms slot for passage of viewing surface and can be released to hang down or be removed for access to operating mechanism and viewing surface. Bottom perimeter flange provides support and trim for acoustical ceiling panels and trim for gypsum board ceiling. The Access case may be ordered in advance and the screen installed later to eliminate field damage. The screen installs in minutes. Housing is symmetrical allowing for left and right hand motor locations and for viewing surface to unroll off front or back of roller. Steel mounting brackets slide in extruded aluminum mounting system along top of case. Brackets supporting roller/fabric assembly slide in tracks inside the top of the case, allowing viewing surface to be centered in case. Steel leveling brackets are attached to case to prevent deflection. Housing designed with internal junction box and plug-in wiring connections to allow housing to be installed and connected to building power supply separately from motor and viewing surface.

1. Quiet Motor mounted inside screen roller on rubber isolation insulators. Motor operates at 44db and is UL certified, rated 110-120V AC, 60 Hz, three wire, instantly reversible, lifetime lubricated with pre-set accessible limit switches.

2. Motor Screen Controls, UL certified.

   a. Low Voltage LVC-IV & LVC-S, Part# 121223

3. Projection Viewing Surface:

a. Matt White XT1000V - On Axis gain of 1.0. 180 degree viewing cone.

4. Tab-Tensioning System:

a. Viewing surface with integrated tabs and cable on each side of fabric to provide tension and ensure flat viewing surface. Viewing surface and tabs CNC cut as a single piece. Tabs RF welded to the back of viewing surface to prevent tab separation. Tab adhesives are not acceptable. Viewing surface inserted into aluminum bottom dowel. Warranted for 5 years against tab separation.

5. Viewing Area H x W.

a. HDTV Format (16:9). Black masking borders standard.

b. 161 inch (4089 mm) diagonal, 80 inches x 140 inches (2032 mm x 3556 mm).

6. Provide an extra screen drop with an overall screen drop of 6 inches (152mm) with a black masking top border.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. Verify rough-in openings are properly prepared.

C. If substrate preparation is the responsibility of another installer, notify Government of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

A. Refer to reflected ceiling plans for locations.

B. Install in accordance with manufacturer's instructions.

C. Install front projection screens with screen cases in position and relationship to adjoining construction as indicated, securely anchored to supporting substrate, and in

manner that produces a smoothly operating screen with plumb and straight vertical edges and plumb and flat viewing surfaces when screen is lowered.

D. Test electrically operated units to verify that screen, controls, limit switches, closure and other operating components are in optimum functioning condition.

3.04 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Beneficial Occupancy.

END OF SECTION

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SECTION 115223 - AUDIO-VISUAL EQUIPMENT SUPPORTS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Motorized projector lifts.

B. Materials included in this section shall meet the requirements for High Performance Sustainable Buildings for New Construction points for the following Sections:

1. 2-3.1.5 - Standby Powered Devices

2. The contractor is expected to understand the HPSB requirements for these sections and include all applicable overhead in their base bid for the necessary documentation to achieve the above listed credits.

1.02 RELATED REQUIREMENTS

A. Section 01 3325 - Project Sustainability Summary

B. Section 01 3329 - Sustainable Design Reporting

1.03 ACTION SUBMITTALS

A. Refer to Section: 01 6000 Product Requirements

B. Product Data: For each type of lift, including manufacturer recommended installation procedures.

C. Shop Drawings: Include dimensions, method of attachment, structural support, and electrical wiring.

D. Samples: Provide finish samples.

E. Sustainability Submittals, Product data for HPSB Compliance:

1. For products using electricity, documentation showing printed statement that device meets FEMP designated efficiency requirements or Energy Star qualified.

2. If the product has a "standby" mode, submit documentation showing that less that one (1) watt of power is consumed when in "standby" mode

1.04 CLOSEOUT SUBMITTALS

A. Refer to Section 01 7800 Closeout Submittals

B. Maintenance data.

1.05 QUALITY ASSURANCE

A. Motors for projector lifts shall be certified for use in the United States and Canada by Underwriters Laboratory (UL), Inc. and shall bear UL label.

1.06 DELIVERY, STORAGE AND HANDLING

A. Refer to Section 01 60 00 Product Requirements

B. Deliver motorized projector lifts in manufacturer's original, unopened, undamaged containers with identification labels intact.

C. Inspect motorized projector lifts for freight damage, concealed or otherwise, upon delivery to project site. Report damage to freight carrier immediately for replacement of motorized projector lifts.

D. Store motorized projector lifts in resealed manufacturer's original containers.

PART 2 PRODUCTS

2.01 SOURCE REQUIREMENTS

A. Source Limitations: Obtain motorized projector lifts from single manufacturer as a complete unit including necessary mounting hardware and accessories.

2.02 MOTORIZED PROJECTOR LIFTS

A. Electrically Operated, Low Profile Lifts: Electrically operated, ceiling recessed projector lift for lowering and retracting projector for operation and storage. Assembly to include controls, mounting hardware, wiring, and other components required for complete operation.

1. Limit Switches: Provide factory set and field adjustable.

2. Maximum Extension: 38.5 inches (622 mm).

3. Maximum Lift Capacity: 100 lbs (45 kg).

4. Approximate Travel Speed: 23 seconds.

B. Operating Mechanism: Operating pan raised and lowered by 110 VAC, 60 HZ, instantly reversible, thermally protected, lifetime lubricated, tubular 3-wire motor and cloth system with scissor arm for stability.

C. Operating Pan: 28-1/4 by 15 inch (718 by 381 mm), steel pan with black powder coat paint finish for attachment of suspended projector.

1. Projector Attachment: Mounted to operating pan with universal projector mount.

a. Universal Projector Mount: Universal bracket suitable for projectors up to 26 lbs (12 kg) with adjustable arms that can be manipulated to fit most projectors with three or four mounting holes. Tilt, yaw and pan adjustments can be made quickly using spring-loaded bolts.

D. Ceiling Closure Panel: Steel closure panel with ceiling tile lip, suspended below projector from rods attached to operating pan. Closure mounted with recess to allow attachment of acoustical ceiling panels.

1. Trim: Metal trim ring to finish ceiling opening.

2. Color: White powder coat.

a. Size: 30-3/4 by 30-3/4 inches (768 by 768 mm)

E. Environmental Airspace Housing: Fabricated from aluminum and steel panels for recessing projector lift in ceiling space used as return air plenum. Provide with universal closure and metal trim to finish ceiling opening.

1. Size: 29-3/8 by 30-1/4 inches (746 by 768 mm).

2.03 CONTROLS

A. Provide 2 control stations to lower, raise, and stop projector lift.

B. Single Station Control: 3-position 110-120V maintained rocker switch with white switches.

C. Low Voltage Station Control: Control station without switches for interface with master control system. Wiring from switches or receivers to low voltage control unit to be 24 V.

D. Video Interface Control: Interface to allow motorized lift to be controlled simultaneously with video projector with 12V outputs and motorized screen through 110V switched outlet. Equip interface with override switch permitting independent operation of mount and screen.

2.04 BACKING PLATES

A. Provide and install structural support materials, configured as a backing plate, for mounting of display brackets.

B. Material should be installed directly behind finished gypsum board.

C. Provide 3/4" plywood, suitable to support loads of 100 lbs. using standards lag mounting configurations.

D. Backing plate should be centered near or on the backbox location as shown on the AV drawings.

E. Backing plate should be at least 4'W x 3'H.

F. Fasten securely to structural framing members as required by the Government.

PART 3 EXECUTION

3.01 PREPARATION

A. Coordinate layout and installation of motorized projector lifts with ceiling construction and related components penetrating or above ceilings such as lighting fixtures, mechanical equipment, ductwork, and fire-suppression system.

B. Coordinate requirements for blocking, structural supports, bracing, and ceiling openings to ensure proper installation of motorized projector lifts.

C. Coordinate location and requirements for power supply conduit, and wiring required for motorized projector lifts and controls.

D. Coordinate installation of recessed motorized projector lifts with construction of suspended acoustical panel ceilings specified in Section 09 51 13 Acoustical Panel Ceilings.

E. Coordinate interface and installation of motorized projector lift controls with provision of motorized screen.

3.02 INSTALLATION

A. Install motorized projector lifts and controls at locations and heights indicated on Drawings.

B. Install motorized projector lifts complete with necessary hardware, anchors, brackets and fasteners; according to manufacturer's written instructions and as specified.

3.03 FIELD QUALITY CONTROL

A. Test motorized projector lifts to verify that lifts, controls, limit switches, closures, and other operating components are functional. Correct deficiencies.

3.04 DEMONSTRATION

A. Demonstrate operation of motorized projector lifts to the Government's designated representatives.

3.05 PROTECTION

A. Protect motorized projector lifts after installation from damage during construction operations. If damage occurs, remove and replace damaged components or entire unit as required to provide units in their original, undamaged condition.

END OF SECTION

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SECTION 122115 - OPERABLE MESH SHADES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Manually operated sunscreen roller shades.

B. Materials included in this section shall meet the requirements for High Performance Sustainable Buildings for New Construction points for the following Sections:

1. 2-5.3.2 - Reduce Volatile Organic Compounds (VOC) Low-Emitting Materials

2. The contractor is expected to understand the HPSB requirements for these sections and include all applicable overhead in their base bid for the necessary documentation to achieve the above listed credits.

1.02 REFERENCES

A. AA DAF-45 - Designation System for Aluminum Finishes; Aluminum Association; 1980.

B. NFPA 701-96 - Standard Methods of Fire Tests for Flame-Resistant Textiles and Films; National Fire Protection Association; 1996.

C. NFPA 70 - National Electrical Code.

1.03 SUBMITTALS

A. Product Data: Manufacturer's specifications describing features, colors, options, accessories, for each type of unit.

1. Include installation instructions and show how installation methods may differ for different openings and mounting substrates.

2. Indicate physical properties, including fade resistance, washability, and fire hazard classification for:

B. Shop Drawings: Plans, elevations, sections, product details, installation details, operational clearances, power and control wiring diagrams, and relationship to adjacent work.

1. Window Treatment Schedule: For all roller shades. Use same room designations as indicated on the Drawings and include opening sizes and key to typical

mounting details.

C. Shop Drawings:

1. Indicate special parts and installation conditions, related to window treatment units, which are not shown or dimensioned in product data.

2. Show how this work adjoins other work.

D. Schedule: Complete schedule with field measurements for each unit.

E. Samples:

1. For color selection: Color charts showing full range of colors and finishes available.

2. For color verification: Samples of actual components to be used; provide for all exposed materials.

3. For each window treatment type: One sample identical with actual product to be used except overall size may be smaller.

F. Certificates: For review and approval, submit manufacturer's written certification stating compliance with requirements for the following:

1. Fire retardance.

2. Physical properties indicated.

G. Sustainability Submittals, Product data for HPSB Compliance:

1. For products containing VOCs, documentation (material safety data sheets (MSDS), third-party certificates, or test reports) showing printed statement of VOC content.

2. VOC Content Limitations: For the specified products, submit documentation of conformance with Specification Section 01 6116 – Volatile Organic Compound (VOC) Content Restrictions.

H. Contract Closeout Submittals:

1. Operation and maintenance data: Include manufacturer's written operation and maintenance instructions.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Obtain roller shades through one source from a single manufacturer with a minimum of twenty years experience in manufacturing products comparable to those specified in this section.

B. Installer Qualifications: Installer trained and certified by the manufacturer with a minimum of five years experience in installing products comparable to those specified in this section.

C. Fire-Test Response Characteristics: Passes NFPA 701-99 small and large-scale vertical burn. Materials tested shall be identical to products proposed for use.

D. Anti-Microbial Characteristics: 'No Growth' per ASTM G 21 results for fungi ATCC9642, ATCC 9644, ATCC 9645.

E. Environmental Certification: Submit written certification from the manufacturer, including third party evaluation, recycling characteristics, and perpetual use certification as specified below. Initial submittals, which do not include the Environmental Certification, below will be rejected. Materials that are simply 'PVC free' without identifying their inputs shall not qualify as meeting the intent of this specification and shall be rejected.

F. Third Party Evaluation: Provide documentation stating the shade cloth has undergone third party evaluation for all chemical inputs, down to a scale of 100 parts per million, that have been evaluated for human and environmental safety. Identify any and all inputs, which are to be known to be carcinogenic, mutagenic, teratogenic, reproductively toxic, or endocrine disrupting. Also identify items that are toxic to aquatic systems, contain heavy metals, or organohalogens. The material shall contain no inputs that are known problems to human or environmental health per the above major criteria, except for an input that is required to meet local fire codes.

G. Recycling Characteristics: Provide documentation that the shade cloth can and is part of a closed loop of perpetual use and not be required to be down cycled, incinerated or otherwise thrown away. Scrap material can be sent back to the mill for reprocessing and recycling into the same quality yarn and woven into new material, without down cycling. Certify that this process is currently underway and will be utilized for this project.

H. Perpetual Use Certification: Certify that at the end of the useful life of the shade cloth, that the material can be sent back to the manufacturer for recapture as part of a closed loop of perpetual use and that the material can and will be reconstituted into new yarn, for weaving into new shade cloth. Provide information on each shade band indicating

that the shade band can be sent back to the manufacturer for this purpose.

I. Mock-Up: Provide a mock-up (manual shades only) of one roller shade assembly for evaluation of mounting, appearance and accessories.

1. Locate mock-up in window designated by the Government.

2. Do not proceed with remaining work until mock-up is accepted by the Government.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver shades in factory-labeled packages, marked with manufacturer and product name, fire-test-response characteristics, and location of installation using same room designations indicated on Drawings and in the Window Treatment Schedule.

1.06 PROJECT CONDITIONS

A. Environmental Limitations: Install roller shades after finish work including painting is complete and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.07 WARRANTY

A. Roller Shade Hardware, Chain and Shadecloth: Manufacturer's standard non-depreciating twenty-five year limited warranty.

B. Roller Shade Installation: 3 year from date of Beneficial Occupancy, not including scaffolding, lifts or other means to reach inaccessible areas.

1.08 SUSTAINABILITY REQUIREMENTS

A. Contractor shall endeavor to provide materials with the lowest possible VOC content.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. A reputable manufacturer with documented experience furnishing and installing products of this specification section for a minimum of 5 years.

2.02 MANUALLY OPERATED SUNSCREEN ROLLER SHADES

A. Sunshade Cloth: Visually transparent single - fabric shade cloth.

1. Mesh Style: 3 percent open

2. Content: 70% PVC and 30% Polyester
3. NFPA 701-2015 Compliance
4. Bacterial and Fungal Resistant in accordance with ASTM G21 & ASTM E2180
5. Acoustical Performance: 0.20 NRC / 0.14 SAA
6. Mesh Weight: 13.12 oz/yd 2
7. Fabric Thickness: 0.028 inches
8. Color: As selected from full range of manufacturer's offerings.

B. Shade Bands: Construction of shade band includes the fabric, the hem weight, hem-pocket, shade roller bar, and the attachment of the shade band to roller tube. Sewn hems and open hem pockets are not acceptable.

1. Hem pockets and hem weights: fabric hem pocket with rf-welded seams (including welded ends) and concealed hem weights.
2. Mounting spline and method of attaching shade band to roller tube shall not require the use of adhesive, tapes, staples, or rivets.

C. Manual Operating Mechanism: Roller shade on continuous roller, provide manually operated control system.

1. Sizes as required.
2. Allow shade to be adjusted to and hold at any position.
3. Construct to allow easy, routine removal of roller and shade without removing operating mechanism or brackets, shade attached to roller or screen will not be accepted.

D. Facia: Formed steel or extruded aluminum; removable; conceal brackets and operating mechanism without notching or attachment of screens or clips; baked-on enamel finish; color as selected by the Government.

E. Roller: Extruded aluminum tube or sufficient diameter to minimize deflection along length when shade is mounted, equipped with cover plate to prevent accidental dislocation of tube.

2.03 FABRICATION

A. Fabricate to fit actual construction; take field measurements of openings before starting fabrication.

B. Use materials that are compatible, will not need to be lubricated, and which will not adversely affect adjacent materials.

C. Make window treatment units fill each opening completely, from jamb to jamb and from head to sill, with a single unit, unless multiple units are specifically indicated.

D. Where window treatment is not set into openings, but is to be installed continuously across the face of windows or walls, fabricate units so that ends occur only over vertical mullions or other definite vertical lines, and at corners.

1. Install lift cords on right side when facing interior side of blind.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates at locations in which window treatment units will be installed. Do not begin installation until conditions are correct.

B. Coordinate and provide blocking as required for installation.

3.02 INSTALLATION

A. Install window treatment in accordance with manufacturer's installation instructions.

B. Set units in correct location, plumb, and level; allow clearance for window operating hardware.

C. Fasten securely to substrates.

3.03 PROTECTION

A. Protect installed work.

END OF SECTION

SECTION 123600 - COUNTERTOPS, AND WINDOW SILLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Countertops for architectural cabinet work.

B. Wall-hung counters and vanity tops.

C. Window sills.

1.02 RELATED REQUIREMENTS

A. Division 22 - Plumbing

1.03 REFERENCE STANDARDS

A. ANSI A208.1 - American National Standard for Particleboard 2022.

B. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position 2022.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2023.

D. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition 2014, with Errata (2016).

E. ISFA 2-01 - Classification and Standards for Solid Surfacing Material 2013.

F. NEMA LD 3 - High-Pressure Decorative Laminates 2005.

G. PS 1 - Structural Plywood 2019.

1.04 SUBMITTALS

A. See Section 01 3001 - Submittals for Submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used, including:

1. Preparation instructions and recommendations.

2. Storage and handling requirements and recommendations.

3. Specimen warranty.

C. Shop Drawings: Complete details of materials and installation ; combine with shop drawings of cabinets and casework specified in other sections.

D. Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and patterns.

E. Test Reports: Chemical resistance testing, showing compliance with specified requirements.

F. Installation Instructions: Manufacturer's installation instructions and recommendations.

G. Maintenance Data: Manufacturer's instructions and recommendations for maintenance and repair of countertop surfaces.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.06 FIELD CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.01 COUNTERTOPS

A. Solid Surfacing Countertops: Solid surfacing sheet or plastic resin casting over continuous substrate.

1. Flat Sheet Thickness: 3/4 inch (19 mm), minimum. See drawings for details.

2. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISFA 2-01 and NEMA LD 3; acrylic or polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.

a. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.

b. Finish on Exposed Surfaces: Matte, gloss rating of 5 to 20.

c. Color and Pattern: As indicated on the finish schedule - refer to drawings.

3. Other Components Thickness: 3/4" inch (19 mm), minimum.

4. Back and End Splashes: Same sheet material, square top; minimum 4 inches (102 mm) high and 3/4" thick.

B. Solid Surfacing Wall Panels for Hand Dryers: Solid surfacing sheet or plastic resin casting over continuous substrate.

1. Flat Sheet Thickness: 3/8 inch (10 mm), minimum. Provide thicker as required to match wall tile depth.

2. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISFA 2-01 and NEMA LD 3; acrylic or polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.

a. Finish on Exposed Surfaces: Matte, gloss rating of 5 to 20.

b. Color and Pattern: As indicated on drawings.

C. Natural Quartz and Resin Composite Countertops: Sheet or slab of natural quartz and plastic resin over continuous substrate.

1. Flat Sheet Thickness: 3/4 inch (19 mm), minimum.

2. Natural Quartz and Resin Composite Sheets, Slabs and Castings: Complying with ISFA 3-01 and NEMA LD 3; orthophthalic polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.

a. Factory fabricate components to the greatest extent practical in sizes and shapes indicated; comply with the MIA Dimension Stone Design Manual.

b. Finish on Exposed Surfaces: Polished.

c. Color and Pattern: As indicated on drawings.

3. Other Components Thickness: 3/4 inch (19 mm), minimum.

4. Exposed Edge Treatment: Built up to minimum 1 1/12 inch (38 mm) thick; beveled edge.

5. Back and End Splashes: Same sheet material, square top; minimum 4 inches (102 mm) high.

6. Skirts: As indicated on drawings.

2.02 MATERIALS

A. Plywood for Supporting Substrate: PS 1 Exterior Grade, A-C veneer grade, minimum 5-ply; minimum 3/4 inch (19 mm) thick; join lengths using metal splines.

B. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.

C. Joint Sealant: Mildew-resistant silicone sealant, clear.

D. Window Sills: Provide solid surface material window sills matching characteristics listed in part 2.01 above. Refer to drawings for details. Provide colors as selected from manufacturers standard colors.

2.03 FABRICATION

A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.

1. Join lengths of tops using best method recommended by manufacturer.

2. Fabricate to overhang fronts and ends of cabinets 1 inch (25 mm) except where top butts against cabinet or wall.

3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.

B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.

1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.

2. Height: 4 inches (102 mm), unless otherwise indicated.

C. Solid Surfacing: Fabricate tops and wall panels up to 144 inches (3657 mm) long in one piece; join pieces with adhesive sealant in accordance with manufacturer's recommendations and instructions.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify the Architect of unsatisfactory preparation before proceeding.

C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

A. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.

B. Seal joint between back/end splashes and vertical surfaces.

3.04 TOLERANCES

A. Variation From Horizontal: 1/8 inch in 10 feet (3 mm in 3 m), maximum.

B. Offset From Wall, Countertops: 1/8 inch (3 mm) maximum; 1/16 inch (1.5 mm) minimum.

C. Field Joints: 1/8 inch (3 mm) wide, maximum.

3.05 CLEANING

A. Clean countertops surfaces thoroughly.

B. Clean other solid surface material thoroughly.

3.06 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Date of Beneficial Occupancy.

END OF SECTION

SECTION 124813 - ENTRANCE FLOOR MATS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Extruded aluminum entrance floor grilles.

1.02 SUBMITTALS

A. See Section 01 3001 - Submittals for Submittal procedures.

B. Product Data: Provide data indicating properties of walk-off surface, component dimensions and recessed frame characteristics.

C. Shop Drawings: Indicate dimensions and details for recessed frame.

1. For recessed frames located within a dimensionally restricted area, show dimensions of space within which the frame will be installed.

D. Samples: Submit two samples, 6 x 6 inch (152 x 152 mm) in size illustrating pattern, color, finish, and edging.

E. Maintenance Data: Include cleaning instructions and stain removal procedures.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. A reputable manufacturer with documented experience furnishing and installing products of this specification section for a minimum of 5 years.

2.02 ENTRANCE FLOOR GRILLES AND GRATINGS

A. Entrance Floor Grilles: Recessed extruded aluminum grille assembly with nominal 1 inch (25 mm) wide tread strips running perpendicular to traffic flow, slots between treads, and perimeter frame forming sides of recess; grille hinged for access to recess.

1. Recess Depth: 3/4 inches (19 mm).

2. Tread Surfaces: Nylon carpet.

3. Colors: As selected by the Government from manufacturer's full range of colors.

4. Length in Direction of Traffic Flow: 6 feet minimum as shown on drawings.

5. Width Perpendicular to Traffic Flow: as shown on drawings.

6. Frame: Anodized aluminum for embedding in concrete; minimal exposed trim; stud or hook concrete anchors.

7. Pan: Anodized aluminum bottom pan with drain, sealed to frame.

B. Mounting: Top of non-resilient members level with adjacent floor.

C. Structural Capacity: Capable of supporting a rolling load of 500 pounds (226.8 kg) without permanent deformation or noticeable deflection.

D. Vibration Resistant Fabrication: All members welded, riveted, or bolted; no snap or friction connections.

2.03 FABRICATION

A. Construct recessed mat frames square, tight joints at corners, rigid. Coat surfaces with protective coating where in contact with cementitious materials

B. Fabricate mats in single unit sizes; fabricate multiple mats where indicated

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that floor opening for mats are ready to receive work.

3.02 PREPARATION

A. Mats: Verify size of floor recess before fabricating mats.

B. Vacuum clean floor recess.

3.03 INSTALLATION

A. Install in accordance with manufacturer's written instructions.

B. Install frames to achieve flush plane with finished floor surface.

3.04 TOLERANCES

A. Maximum Gap Formed at Recessed Frame From Mat Size: 1/4 inch (6 mm).

END OF SECTION